

SOLiViA 11 TR



Operation and installation manual for
SOLiViA 11 EU G4 TR



This manual is for SOLIVIA 11 EU G4 TR solar inverters with software version 1.2.8.

This manual is subject to change.

Please check our website at www.solar-inverter.com for the most up-to-date manual version.

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All information and specifications are subject to change without notice.

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1. About this manual

Congratulations on the purchase of the technically advanced solar inverter SOLIVIA EU G4 TR.

This manual will help you become familiar with this product.

Please observe the safety regulations of the individual countries. Careful handling of your product will contribute to its service life durability and reliability. These are essential prerequisites for maximum yield from your product.

1.1 Purpose of this manual

This manual is part of the product. Keep this manual in a safe place.

Read this manual carefully and follow the instructions given in this manual. This manual contains important information for installing, commissioning and operating the solar inverter.

Observe and follow the information for safe use (see “3. General safety instructions”, p. 10).

Both the installer and the operator must have access to this manual und must be familiar with the safety instructions.

For a safe and normal operation of the solar inverter, it is absolutely necessary that the solar inverter is installed and operated according to this manual (see IEC 62109-5.3.3). Delta Energy Systems is not responsible for damage caused by failure to observe the installation and operation instructions in this manual.


1.2 Target group of this manual


This manual is addressed to qualified electrical experts.


For the operator only the chapters “8. Production information”, p. 62 and “11. Diagnostics and maintenance”, p. 88 are relevant. All other actions may only be executed by qualified electrical experts.

1.3 Warnings and symbols

Here, you will find explanations for the warnings and symbols used in this manual.

 DANGER	Indicates a hazardous situation. If not prevented, an accident will result in death or serious injury to humans.
---	---

 WARNING	Indicates a hazardous situation. If not prevented, an accident could result in death or serious injury to humans.
--	--

 CAUTION	Indicates a hazardous situation. If not prevented, an accident could result in moderate or minor injury to humans.
--	---

NOTICE	Indicates a hazardous situation, that could result in property damage.
---------------	--



This symbol warns of the dangers of electric shock due to high electrical voltage.



This symbol warns against a general danger.

1.4 Writing conventions

1.4.1 Procedure steps

A numbered sequence of working steps has to be followed in the given order.

1. Procedure step

→ When the solar inverter reacts on a procedure step, this reaction is marked with an arrow.

2. Procedure step

3. Procedure step

The end of a sequence of procedure steps is marked as follows:

☒ End of a sequence of working steps

An instruction that consists of only one working step is displayed as follows:

► Procedure step

1.4.2 User buttons and LEDs

User buttons are referenced in bold type: **Esc** button.

LEDs alarms on the device are referenced in italic type: *FAILURE* LED

1.4.3 Software

Software menu items are shown as: **User settings** menu.

Input fields are used to change the value of a parameter. Any kind of input field in the display is marked like: ***Cos phi*** input field.

2. Intended use

The solar inverter connects a photovoltaic system to the public grid. The solar inverter converts direct current into alternating current, which is fed into the public grid.

This European solar inverter can be used in the following countries: Belgium, Czech Republic, France, Germany, Greece, Italy, Portugal, Spain and United Kingdom. (This list is still under the regulatory procedure.)

The solar inverter is for use in grid-connected photovoltaic systems. It is not for mobile use.

The solar inverter may be used indoors and in protected outdoor areas with IP65 environmental conditions.

The solar inverter may only be used in the indicated power range and under the stated ambient conditions.

The solar inverter includes monitoring units, such as anti-islanding protection.

The solar inverter may only be operated according to its intended use.

3. General safety instructions



DANGER



Risk of death through dangerous voltage

During operation, dangerous voltage is present in the solar inverter. Dangerous voltage is still present for 5 minutes after disconnecting all sources of power.

► Never open the solar inverter. The device contains no user-serviceable parts. Opening the cover will invalidate the warranty

- Inappropriate handling can lead to physical injury and material damage!
- Installation and operational start-up work may be implemented only through qualified electrical experts.
- For a safe and normal operation of the solar inverter, it is absolutely necessary that the solar inverter is installed and operated according to this manual (see IEC 62109-5.3.3). Delta Energy Systems is not responsible for damage caused by failure to observe the installation and operation instructions in this manual.
- There are no user serviceable components and all repairs need to be performed by the manufacturer.
- Observe all points in this installation and operation manual!
- Isolate the solar inverter from the grid and the PV modules before carrying out any work on it.
- Do not pull out cables when the solar inverter is under load because there is a danger of an electric arc.
- To ensure protection against lightning, follow the local regulations in your country.
- As a result of high temperatures, the surface of the solar inverter can become very hot.

- Sufficient cooling is necessary.
- The solar inverter is heavy (see “13. Technical data”, p. 99). This can cause injury when not handled correctly.
- The unit has a high leakage current (see “13. Technical data”, p. 99). The PE conductor **MUST** be connected prior to commencing operation.
- To the RS485, USB and I/O interfaces only devices according to SELV (EN 69050) may be connected.
- Do not remove warning labels that are attached to the solar inverter by the manufacturer.
- To ensure IP65 protection, all used and not-used connectors must be adequately sealed.

4. System description

4.1 Scope of delivery

- Solar inverter
- Mounting plate
- Operation and installation manual
- Amphenol AC connector
- 2 M6 nuts and 2 M6 washers
- Connector for the I/O interface
- Labels “Power limitation”

4.2 General overview

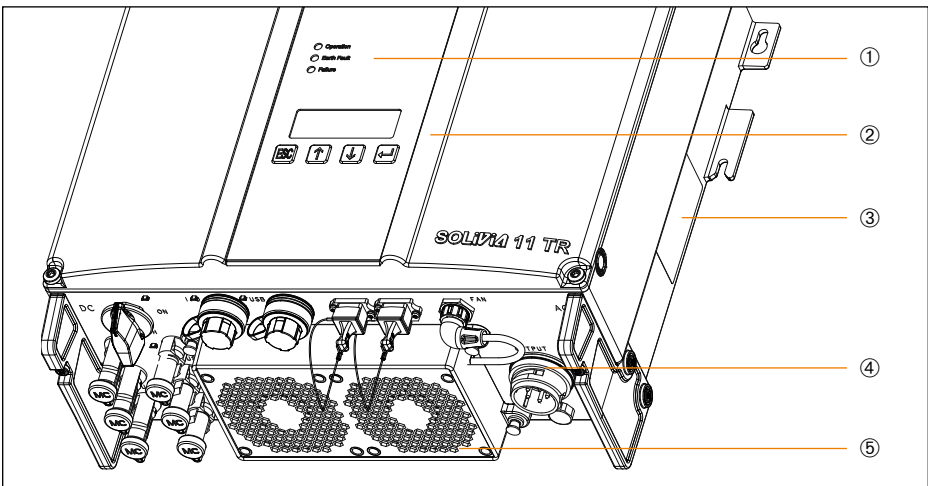


Image 4.1.: Components of the solar inverter

No.	Designation	Description
①	Status LEDs	“4.4 Status LEDs”, p. 14
②	Display and buttons	“4.5 Display and buttons”, p. 14
③	Type label	“4.3 Type label”, p. 13
④	Electrical connectors	“4.6 Electrical connectors”, p. 21
⑤	Fan for cooling	“4.7 Fan”, p. 23

4.3 Type label

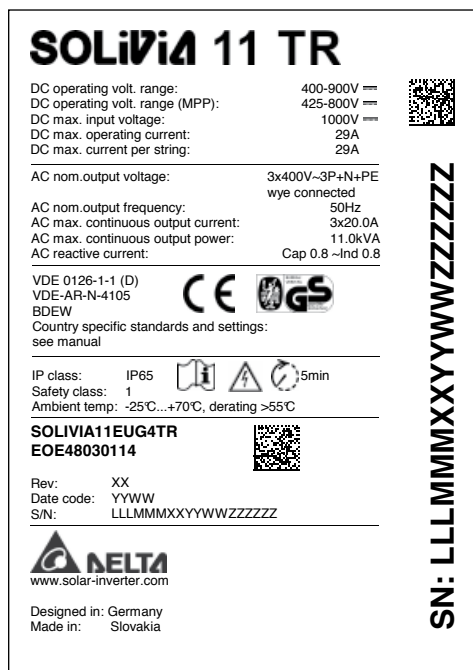
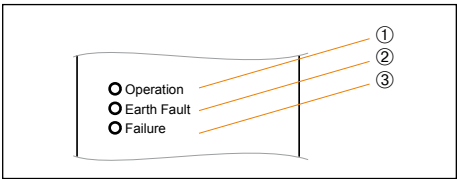


Image 4.2.: Type label

Warning symbols on type label	Description
	Risk of injury through hot surfaces During operation the surface of the solar inverter can get hot. ► Use safety gloves when working with the solar inverter.
	Risk of death through dangerous voltage During operation, dangerous voltage is present in the solar inverter. Dangerous voltage is still present for 5 minutes after disconnecting all sources of power. ► Never open the solar inverter. The device contains no user-serviceable parts. Opening the cover will invalidate the warranty.
	Read the manual before working with the inverter and follow the instructions given in the manual.

4.4 Status LEDs



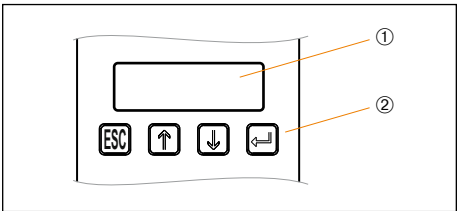
No.	Label	Designation	Color
①	OPERATION	Operation	Green
②	EARTH FAULT	Earth fault	Red
③	FAILURE	Failure	Yellow

Image 4.3.: Status LEDs

For LED messages, see “13.1.3 Display messages”, p. 74.

4.5 Display and buttons

4.5.1 Components



- ① Display
- ② Buttons for display

Image 4.4.: Components of the display

Display layout

	Format
	Continue
→Date:	DD.MM.YYYY
Time:	12h

Image 4.5.: Display

The display has 4 lines with 20 characters each.





The 1st line shows the name of the menu that is currently displayed.

The 2nd to 4th line show the menu entries.

The arrow in the 3rd line marks the currently selected menu entry.

The 3rd line has a small arrow as first character to indicate the currently selected menu entry.

Display buttons

Sign	Usage	Designation in manual
	To exit a menu and to cancel an input without accepting an adjusted value	Esc
	To move in a menu and to adjust values	UP
	To move in a menu and to adjust values	DOWN
	To select a menu entry and to confirm an input with accepting the adjusted value	ENTER

4.5.2 Operating the display

4.5.2.1 Menu structure

The menus can have up to three levels:

[Main menu]

...

300 USB features

400 Production info

410 Actual data

411 Actual overview

412 Actual data AC

...

420 Day statistics

430 Week statistics

...

500 User settings

...

Most of the menus consist of a 3-digit number and a menu title.

4.5.2.2 Go-to function

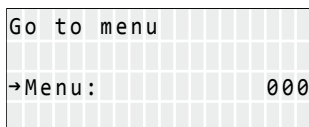
NOTE



To go directly to a specific menu in the display, you can use the Go-to function of the solar inverter.

For a list of available menu numbers, see “[14.3 Overview menu structure](#)”, p. 106

1. To open the **Go to** menu, press the **Esc** button on the solar inverter for at least 3 seconds.
→ The **Go to** menu is opened.



2. To enter a menu number, press the **ENTER** button.
→ The first digit is flashing.
3. Use the **Up/Down** buttons to enter the first digit of the menu number. Press the **ENTER** button when finished.
→ The second digit is flashing.
4. Enter the second and the third digit.
5. Press the **ENTER** button.
→ The menu with the entered menu number is displayed.

4.5.2.3 Moving in menus

To move in a menu, use the **UP/Down** buttons.

```
Solivia ## G4
Production info
→User settings
Diagnostic&Alarm
```



Use the **Down** button to move to the next lower menu entry and the **UP** button to move to the next upper menu entry.


```
Solivia ## G4
User settings
→Diagnostic&Alarm
Inverter info
```



```
Solivia 11 G4
Diagnostic&Alarm
→Inverter info
Short cut
```

4.5.2.4 Selecting a menu entry


► To open a menu entry, press the **ENTER** button.

Initial display	Press Button	Result
<pre>Solivia ## G4 User features →Production info User settings</pre>	 ENTER	<pre>400 Production info Feed-in settings →Actual data Day statistics</pre>

System description

4.5.2.5 Leaving a menu

- To get back to the parent menu, press the **Esc** button.

Initial display	Press Button	Result
400 Production info Feed-in settings →Actual data Day statistics	 Esc	Solivia ## G4 User features →Production info User settings

4.5.2.6 Adjusting values

There are several menus where you have to adjust parameters. To change a parameter value, the **Up/Down** buttons are used. The example shows the procedure to change a value. This procedure is the same for all menu entries.






Example: Adjusting the date














You want to set the date. The menu to set the date is **110 Date & time**.

NOTE



You can cancel the editing mode or move to the previous menu entry or input value by pressing the **ESC** button.

Use buttons	Action	Result
 	1. In the main menu, press the Up/Down buttons to select Install settings .	Solivia 11 G4 Short cut →Install settings Options
	2. Press ENTER to open the menu 100 Install settings .	100 Install settings RS485 →Language: English Date & time
 	3. Press the Up/Down buttons to select Date & time .	100 Install settings Language: English →Date & time: Display settings





Use buttons	Action	Result
	4. Press ENTER to open the menu 110 Date & time.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 09/14/2011</div> <div>Time: 03:15:22pm</div>
 	5. When necessary, press the Up/Down buttons to select the menu entry Date.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 09/14/2011</div> <div>Time: 03:15:22pm</div>
	6. To start adjusting, press ENTER. → The digits for month are flashing.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 09/14/2011</div> <div>Time: 03:15:22pm</div>
 	7. Press the Up/Down buttons to adjust the month.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 11/14/2011</div> <div>Time: 03:15:22pm</div>
	8. To accept the value, press ENTER. → The digits for days are flashing.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 11/14/2011</div> <div>Time: 03:15:22pm</div>
 	9. Press the Up/Down buttons to adjust the day.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 11/17/2011</div> <div>Time: 03:15:22pm</div>
	10. To accept the value, press ENTER. → The digits for the year are flashing.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 11/17/2011</div> <div>Time: 03:15:22pm</div>
 	11. Press the Up/Down buttons to adjust the year.	<div>110 Date & time</div> <div>Format</div> <div>→Date: 11/17/2012</div> <div>Time: 03:15:22pm</div>
	12. Press the ENTER button after adjusting the year.	

System description

Use buttons	Action	Result																
	<input checked="" type="checkbox"/> The value is taken over and the editing mode is left.	<table><tr><td>110</td><td>Date & time</td><td></td><td></td></tr><tr><td></td><td>Format</td><td></td><td></td></tr><tr><td>→Date:</td><td>11/17/2012</td><td></td><td></td></tr><tr><td>Time:</td><td>03:15:22pm</td><td></td><td></td></tr></table>	110	Date & time				Format			→Date:	11/17/2012			Time:	03:15:22pm		
110	Date & time																	
	Format																	
→Date:	11/17/2012																	
Time:	03:15:22pm																	

4.5.3 Short cuts

The table shows special short cuts for the display buttons.

Use buttons	Action
 	Pressing Esc and Down button at the same time opens the menu 100 Installation to select the display language, see “9.1.1 Language” , p. 66
 	Pressing Up and Down buttons at the same time opens the menu 800 Short cut to set the short cut menu, see “9.5 Standard menu” , p. 81.

4.6 Electrical connectors

4.6.1 Overview

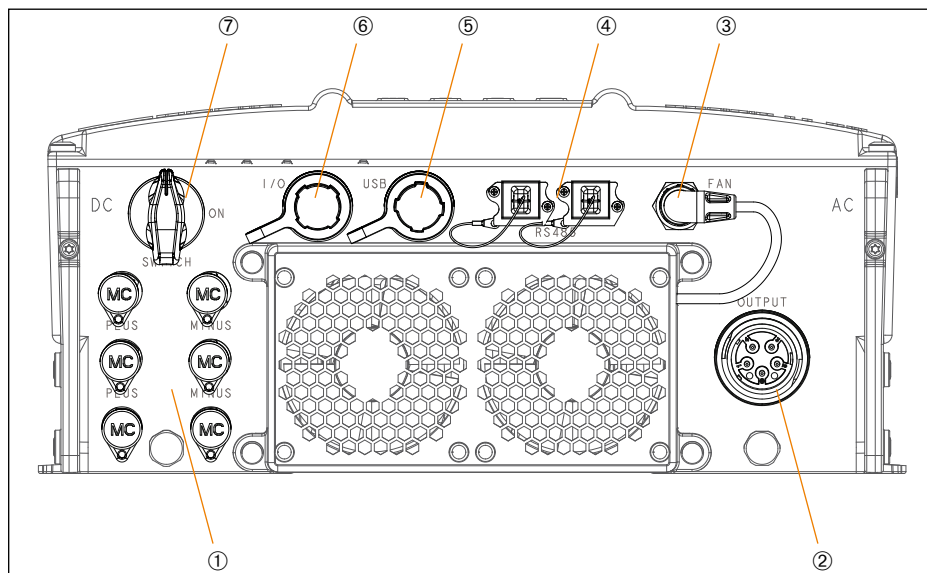


Image 4.6.: Electrical connectors

No.	Designation	Description
①	DC connectors	“4.6.2 DC connectors and DC switch”, p. 22
②	AC connector	“4.6.3 AC connector”, p. 22
③	Fan connector	“4.7 Fan”, p. 23
④	2 x RS485 interfaces	“4.6.4 RS485 (EIA485) interface”, p. 22
⑤	USB interface	“4.6.5 USB interface”, p. 23
⑥	I/O interface	“4.6.6 I/O interface”, p. 23
⑦	DC switch	“4.6.2 DC connectors and DC switch”, p. 22

4.6.2 DC connectors and DC switch

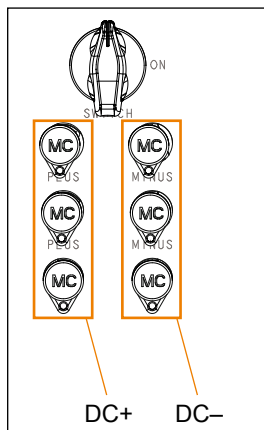


Image 4.7.: DC connectors and DC switch

The DC connectors are used to connect the string(s) of PV modules to the solar inverter.

The solar inverter has an integrated DC switch to disconnect the DC connectors from the DC voltage of the PV modules.

The maximum input current load of each individual Multi-Contact MC4 connector is 29 A.

Type of connector: Multi-Contact MC4 connectors; 3 x for DC negative, 3 x for DC positive

4.6.3 AC connector

The AC connector is used to connect the solar inverter to the grid.

The solar inverter must be connected to a 3-phase Wye (star) configuration grid (L1, L2, L3, Neutral N and Protective Earth PE).

The connection must be done by respecting one of the following earthing systems:

- TN-C
- TN-S
- TN-C-S
- TT

Type of connector: Amphenol C16-3 AC, scope of delivery

4.6.4 RS485 (EIA485) interface

The RS485 interfaces are used to connect one or more solar inverters to a monitoring system. The two interfaces are internally connected 1:1. The solar inverters are connected in series.

Each solar inverter must have a unique ID, on the last one in a series the termination has to be switched on. This can be done either during (see [“7. Commissioning”, p. 45](#)) or later on (see [“9.1.6 RS485 \(EIA485\)”, p. 69](#)).

Type of connector: 2 x RJ45

4.6.5 USB interface

The USB interface is used for saving and loading data and reports.

Supported features:

- Firmware update
- Save and load settings
- Save swap data
- Create reports
- Service

For a detailed description of the features and information how to use them, see [“10. Saving and loading data and settings”, p. 82](#).

Type of connector: USB A

4.6.6 I/O interface

The I/O interface cannot be used at the moment.

4.7 Fan

The external fan is a standard component of the solar inverter and provides sufficient ventilation to cool the solar inverter. Cooling does always have a positive effect on the integrity of the solar inverter.

To replace the fan, see [“12.1 Replacing fan”, p. 98](#).

5. Operating behavior

5.1 Technical structure of the solar inverter

The solar inverter is galvanic isolated from the grid through a DC/AC converter with an integrated high-frequency transformer.

MPP-tracking

The solar inverter has one MPP tracker (MPP = Maximum Power Point).

The MPP tracker is used to adjust the DC voltage depending on the varying solar irradiation levels and ambient temperatures. So the maximum power output of the PV modules can be achieved.

DC input voltages

The values of the DC input voltages referred to in this section can be found in chapter “[13. Technical data](#)”, p. 99.

The **maximum input voltage** must never be exceeded. Take measurements and use overvoltage protection on the DC side to avoid higher voltages. The maximum open-circuit voltage will occur at the lowest temperatures anticipated. You can find more detailed information about temperature dependency in the data sheet of the PV modules.

The **feed-in operation voltage range** of the solar inverter defines at which input voltages the solar inverter feeds power into the grid.

The **full power MPP input voltage range** of the solar inverter defines at which input voltages MPP tracking is active. This facilitates the use of PV modules by a variety of manufacturers.

The device's power consumption is kept to a minimum.

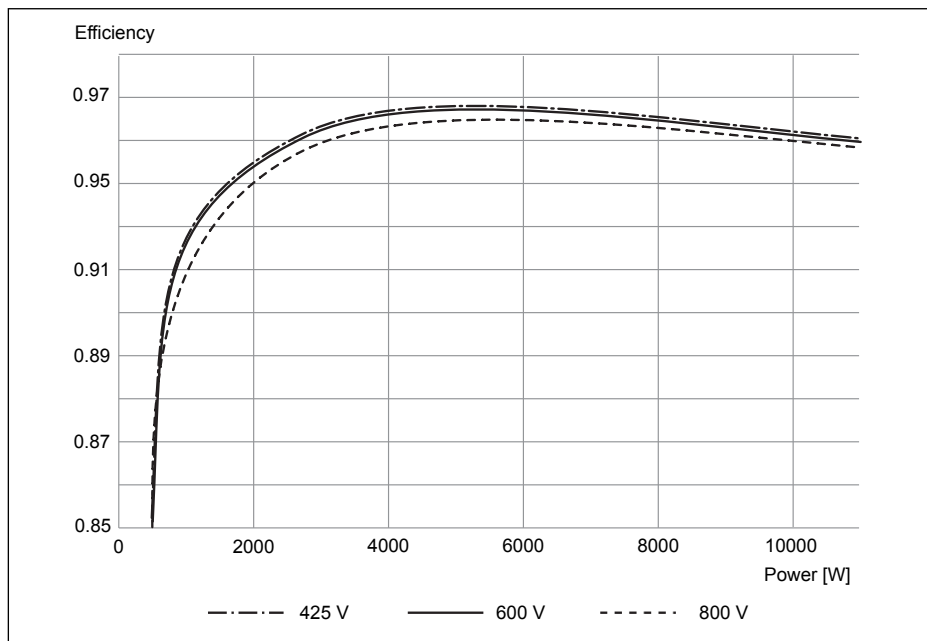


Image 5.1.: Efficiency over power

Ambient conditions

The high-quality aluminum casing corresponds to protection class IP65 (water-jet-proof and dust-proof) and surface is protected against weathering. The cooling characteristic profile is designed so that operation of the inverter is possible with ambient temperatures from -25°C to $+70^{\circ}\text{C}$.

A convection cooling system reduces the power dissipation caused by the voltage conversion. An internal temperature control protects the interior of the solar inverter against excessive temperatures. In case of high ambient temperatures, the maximum transferable power is limited.

5.2 Operation method

The solar inverter converts direct current from the solar cells into alternating current. This enables you to feed your self-produced solar energy into the public grid.

Due to efficient MPP tracking, maximum capacity utilization of the solar energy plant is ensured even in the case of cloudy sky conditions.

Maximum power point (MPP) tracking is a prediction and correction method with integration of PV module voltage regulation. The MPP tracking is maximizing the power supplied to the AC grid.

The integrated multiple MPP scanning algorithm allows maximum MPP tracking.

Operating behavior

The string concept means that PV modules are always connected in series (in a string) and/or that strings with the same voltage are connected in parallel to the solar inverter with the aim of significantly reducing the photovoltaic system's cabling requirements.

The fact that the modules are connected in strings also means that the photovoltaic system can be perfectly matched to the solar inverter's input voltage range.

5.3 Data evaluation and communication

The solar inverter is controlled by microcontrollers, which also implement interface communication and the monitoring of values and messages on the display.

The solar inverter collects and stores several data that can be viewed directly on the display or via PC. The data read-out over the integrated interface and the display is possible only in solar operation.

Production information

The production information is available for the actual day, week, month etc. The production information is saved on a monthly basis.

Configuration settings storage

The configuration settings of the solar inverter can be exchanged between solar inverters via USB pendrive.

Warning and error messages

Each warning or error message is saved in the solar inverter with a time stamp. The most recent message can be viewed on the display.

Reports

Reports can be saved to a USB pendrive. The reports contain information about production, events, settings and internal logs. For MVD and LVD grids, the latest 5 errors are saved together with the settings.

6. Installation

6.1 Planning the installation

General instructions

- ▶ Mount the solar inverter to the wall first, then install electrical connections.
- ▶ Noise generation can affect usage in residential areas. Therefore, avoid installation in residential areas.
- ▶ Ensure legibility of the LEDs and the display (check read-off angle and installation height).
- ▶ Install the device on a non-flammable support base.
- ▶ Do not install on resonating surfaces (light construction walls etc.).
- ▶ Check the wall whether it can carry the heavy weight.
- ▶ Use anchors and screws that are appropriate for the material of the wall and the heavy weight.
- ▶ Always use the mounting plate that is delivered with the solar inverter.
- ▶ Mount the solar inverter vertical, see [Image 6.1](#).

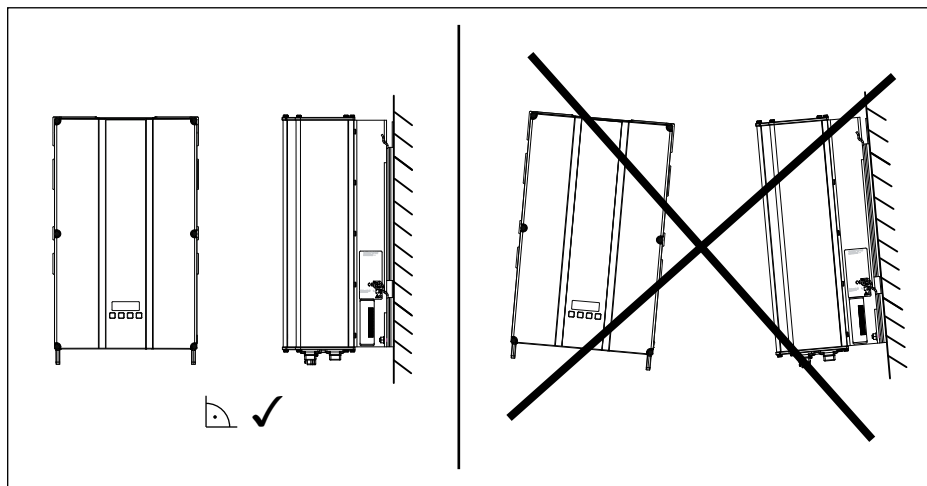


Image 6.1.: Mounting orientation

Installation

Ambient conditions

- ▶ The protection class is IP65. So the solar inverter can be installed both indoors and in protected outdoor areas.
- ▶ The ambient operating temperature range of the solar inverter is -25°C to $+70^{\circ}\text{C}$. An increased ambient temperature can reduce the efficiency of the PV system. Especially when the solar inverter is installed indoors, ensure sufficient cooling.

The solar inverter minimum mounting clearances must be satisfied to avoid overheating. For proper air circulation observe the mounting distance to walls and other devices. Do not install one above the other. See [Image 6.2](#).

When necessary, install separate cooling equipment.

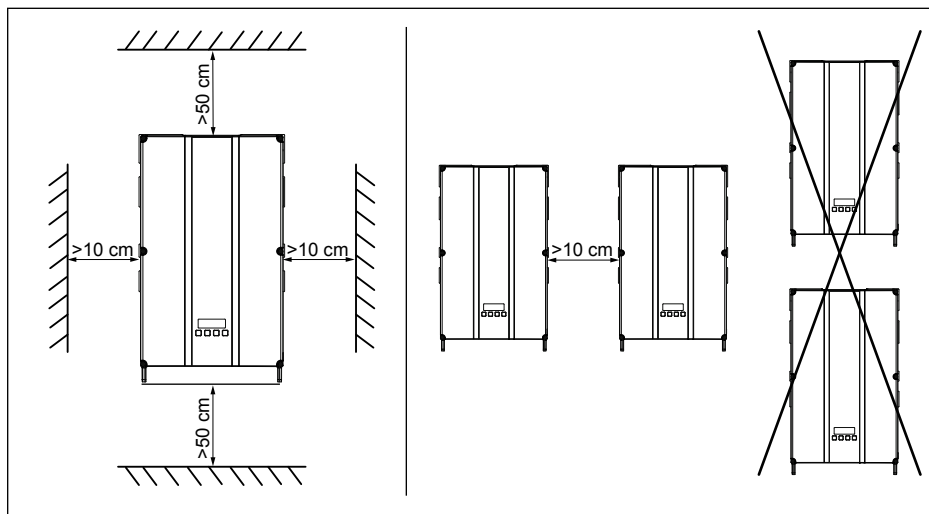


Image 6.2.: Mounting dimensions for convection

- ▶ Prevent direct exposure to sunlight.
- ▶ Prevent heavy contamination with dirt. Dust can impair the unit's performance.
- ▶ For getting the highest reliability of your installation and all external components (cables, protection equipments etc), protect the system with a gasket against direct water jet (strong rain, direct snow deposition).

6.2 Mechanical Installation

6.2.1 Mounting plate



WARNING



Danger of injury due to heavy weight

The solar inverter is heavy (see “13. Technical data”, p. 99). This can cause injury when not handled correctly.

- ▶ The solar inverter has to be lifted and handled by at least two persons. Or use an appropriate lifting means, e.g. a crane.

Needed tools and equipment

Included in scope of delivery:

- Mounting plate
- 2 mounting nuts and washers to fasten the solar inverter to the mounting plate

Not included in scope of delivery:

- Screws (6 mm) + anchors to mount the mounting plate to the wall. At least 4 screws are needed.

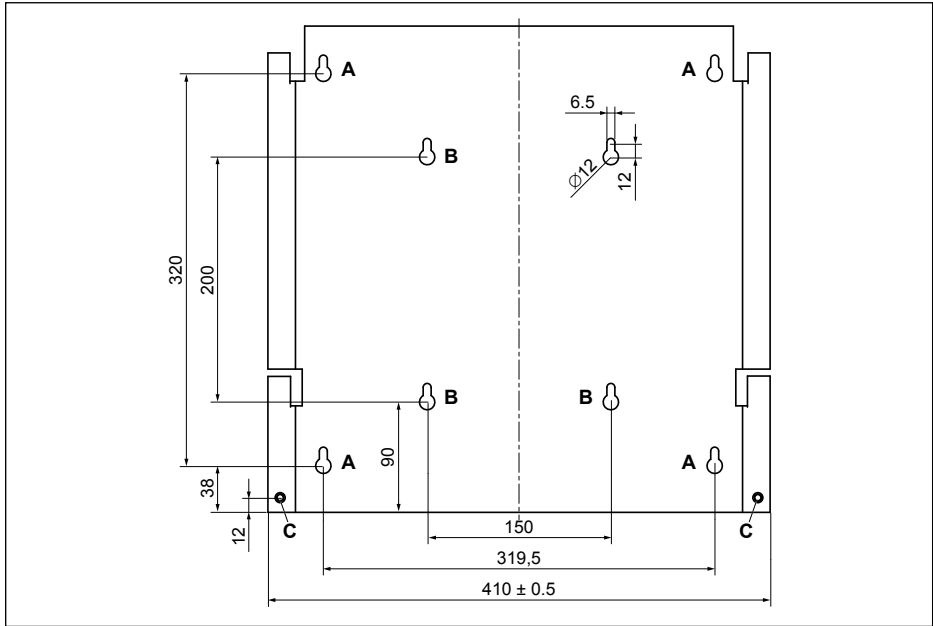


Image 6.3.: Dimensional drawing of mounting plate

1. Mount the mounting plate to the wall with at least 4 screws and anchors (\varnothing 6 mm). With 4 screws use 4 holes **A** or 4 holes **B** (see [Image 6.3, p. 30](#)). You can use the mounting plate as a template for marking the positions of the boreholes.
2. Tighten the screws firmly to the wall.
3. With at least two people hang the solar inverter into the mounting plate, see [Image 6.4, p. 31](#).

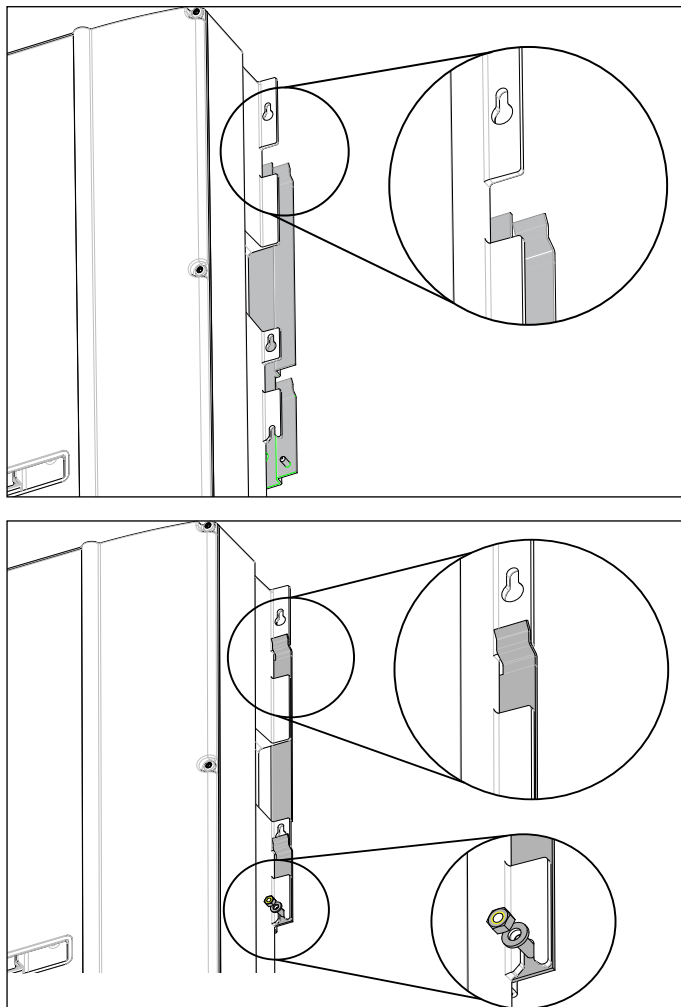


Image 6.4.: Hanging solar inverter onto mounting plate

Installation

4. Fasten the solar inverter to the mounting plate by tightening the mounting nuts and washers on the threaded bolts (see [Image 6.3](#), position C). (The threaded bolts are also used to connect the earth wire to the solar inverter.)
5. After finishing, check the mechanical installation.

6.3 Electrical installation



DANGER



Risk of death or heavy injury due to dangerous voltage

- Switch the AC line potential-free before removing or inserting the AC connector.

6.3.1 Grid connection

General instructions

The grid (AC output) is connected over a Amphenol C16-3 AC connector. You can find the correct allocation on the screw-type terminal connection of the connector. The solar inverter must be connected to a 3-phase Wye (star) configuration grid (L1, L2, L3, Neutral N and Protective Earth PE).

The connection to the grid must be done by respecting one of the following assembling schematics:

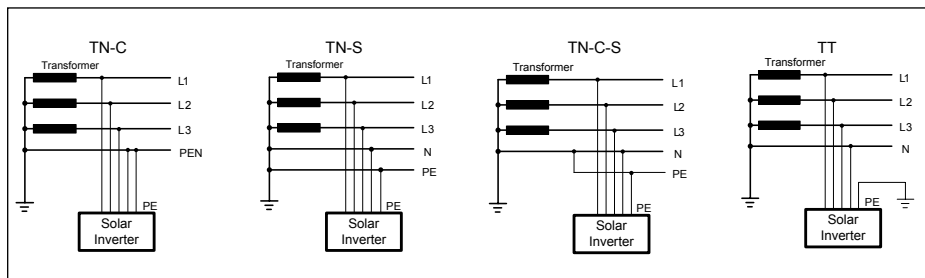


Image 6.5.: Earthing system of different grids

To carry out an energy measurement, a meter must be attached between the grid feed-in point and the solar inverter (in accordance with your local utility company directive concerning “In-plant generation systems on the low-voltage grid”).

By means of the integrated anti-islanding protection, the solar inverter is switched off when the grid is down.

The inrush current is 20 A per phase for a maximum of 20 ms.

The maximum allowed fuse rating for the automatic circuit breaker is 32 A (type B).

The solar inverter provides a galvanic separation between DC side and AC side. Therefore, it is not possible to get direct currents on the AC side, so a RCMU type A is sufficient. We recommend the use of a 32 A RCMU, but always follow specific regulations for your country. The typical leakage current is below 3.5 mA.

NOTICE



The secondary short-circuit current rating at the transfer connection point to the public electricity supply system is increased by the nominal current of the connected solar inverter.

The connection to the circular connector can be made with a flexible or rigid cable and a conductor cross section of at least 4.0 mm² copper (coefficient factor $k = 1$). This connector is developed for connection to copper wires (for other applications please contact Amphenol).

Observe the grid impedance requirements at the supply terminal (cable length, cable cross section).

Consider the cable length and the cable cross-section, due to risk of undesirable temperature rise and power losses. In some countries (e.g. France, Germany) system installation requirements have to be followed (UTE C15-712-1, VDE 0100 712). This recommendation will define minimum cable cross sections and protections against overheating due to high currents. Please make sure that you follow specific requirements in your country.

For the security of your installation and for the safety of the user, install required safety and protection devices that are applicable for your installation environment (e.g. automatic circuit breaker and/or overcurrent protection equipment).

For France, an extra kit from Delta is available. This kit contains all components to fulfill UTE C15-712-1 requirements. ("[14.2 Order numbers](#)", p. 104).

Needed tools and equipment

Included in the scope of delivery:

- Circular connector, type Amphenol C16-3 with female insert

Not included in scope of delivery:

- 5-wire cable with L1, L2, L3, N and PE wire for AC connection. The AC circular connector is approved for cable diameters between 11 mm and 20 mm and a conductor cross section of 4 mm² or 6 mm².
- Strain relief for the cables
- To connect the earth wire to the solar inverter (see [Image 6.3](#), position **C**), additionally a lock washer is needed.

Installation

Connecting cable and circular connector

NOTICE



Observe the pin assignment of the circular connector. An incorrect assignment can result in the solar inverter being destroyed.

1. Remove the sheathing on the cable as shown and remove 10 mm insulation on the individual wire ends.

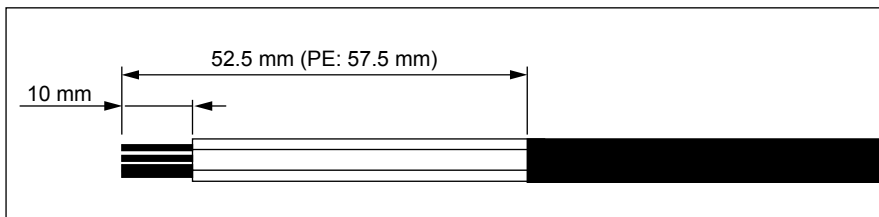


Image 6.6.: Stripping cable and wire sheathing

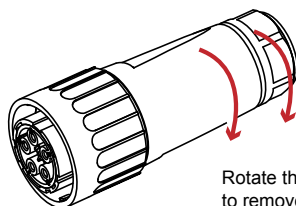
2. If the cable diameter is between 16 mm and 20 mm, remove the sealing gasket (the inner, blue ring on the backside of the cable gland).



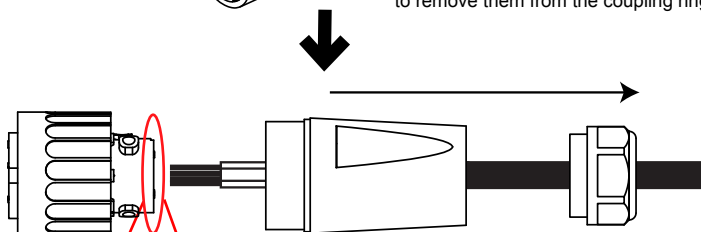
Image 6.7.: Remove inner blue sealing gasket

3. Connect the circular connector to the cable, see image on the next page. After disassembly of the circular connector, adhere to the correct polarity for proper AC wiring. The solar inverter allows either positive or negative phase sequence.

The female cable connector needs to be wired as shown below.

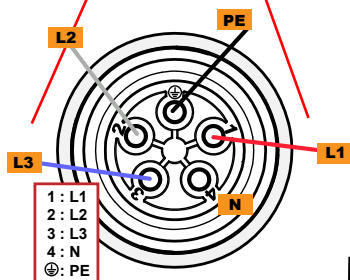


Rotate the connector housing and cable gland to remove them from the coupling ring.

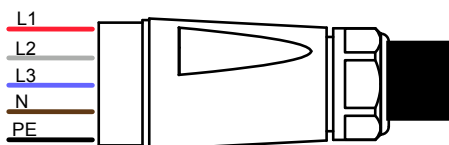


Slide the connector housing and cable gland onto the cable.

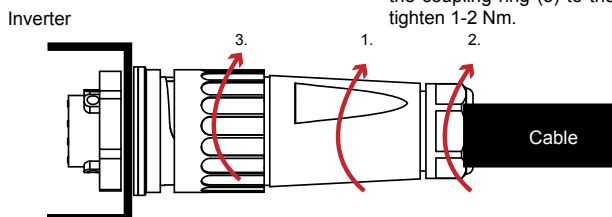
NOTE: Rear view of cable connector



To wire the connector refer to placement of L1, L2, L3, N and PE shown to the left. Screw termination is provided to fix the wires to the contacts.



After wiring the mating connector, screw the connector housing (1) to the coupling ring (3). To do this push the coupling ring (3) to the connector housing (1) and tighten 1-2 Nm.



Next tighten the cable gland (2) to the connector housing (1). Tightening torque for cable sheath diameters between 11 and 20 mm: 6 to 8 Nm. Rotate the coupling ring (3) to mate the connector with the inverter's AC plug.

Installation

4. When using cable diameters between 11 mm and 13 mm, mount a strain relief just behind the circular connector. For other cable diameters it is recommended to mount a strain relief.
5. Ground the PE conductor of the AC cable to the designated terminal.
6. Ground the mounting plate.

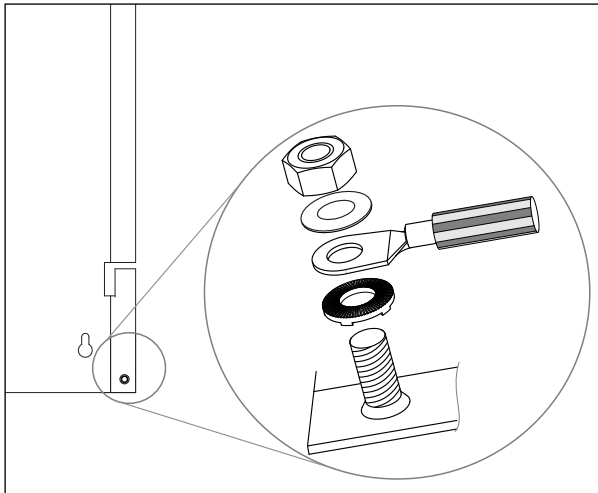


Image 6.8.: Ground mounting plate

6.3.2 Connection of PV modules

CAUTION



Risk of death or heavy injury due to dangerous voltage

There can be dangerous voltages across the DC connection terminals of the solar inverter.

- Ensure that no-one is coming into contact with the DC connection terminals.
- Never disconnect the PV modules from the solar inverter under load. First, switch off the grid, so that the solar inverter cannot absorb any further power. Next, open the upstream DC switch.

NOTICE



To ensure IP65, all unused connectors and interfaces must be closed with the fitted covers.

General instructions

Before the photovoltaic system is connected, the polarity of the PV voltage at the Multi-Contact MC4 connectors must be checked to ensure that it is correct.

The solar inverter contains a DC switch.

The connection of the PV module is implemented using MC4 connectors, where the DC negative (MINUS) pole is located on the connector right row and the DC positive (PLUS) pole on the connector left row. The connectors are coded to prevent you from accidentally plugging them into the wrong terminal.

The maximum input voltage of the solar inverter for feed-in operation is 900 V. The maximum current load of each individual Multi-Contact MC4 connector is 29 A.

The solar inverter can be grounded both on the DC plus and the DC minus side. The solar inverter has an isolation and grounding monitoring on the DC side. The options can be configured in the menu **230 Grounding**, see [“9.4.1 Isolation and grounding monitoring”](#), p. 80.

Required tools and equipment

Not included in the scope of delivery:

- 1-wire cables for DC connection.

Earth continuity must be implemented close to the solar inverter. We suggest using Delta's grounding kit “Grounding Set A Solar”.

Grounding kit	Part number Delta
Groundig Set A Solar	EOE990000275

Cable coupler types for DC cable connection to the inverter. The DC+ connector of the solar inverter is male, the DC– connector is female.

DC connector	Cable coupler type	Wire size		Range of cable sheath diameter mm	Multi-Contact order number
		mm ²	AWG		
DC+	Female	1.5/2.5	14	3 - 6	32.0010P0001-UR
				5.5 - 9	32.0012P0001-UR
		4/6	10	3 - 6	32.0014P0001-UR
				5.5 - 9	32.0016P0001-UR
DC–	Male	1.5/2.5	14	3 - 6	32.0011P0001-UR
				5.5 - 9	32.0013P0001-UR
		4/6	10	3 - 6	32.0015P0001-UR
				5.5 - 9	32.0017P0001-UR

UTE kit according to latest French standard UTE C 15-712-1

The UTE Multi-Contact kit is dedicated for the latest French standard UTE C 15-712-1. This contains 8 DC locking devices, an assembly tool and an additional signaling flash drive. This kit will allow you to fulfill DC protection and signaling requirements specified in the UTE C 15-712-1 regulation.

UTE kit Multi-Contact	Part number Delta
UTE kit Multi-Contact for European SOLIVIA solar inverters	EOE90000341

6.3.3 RS485 (EIA485) interface

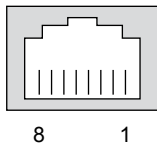
NOTICE



To ensure IP65, all unused connectors and interfaces must be closed with the fitted covers. The dedicated cables must be used, not standard cables.

The RS485 interfaces are used to connect one or more solar inverters to a monitoring system. The two interfaces are internally connected 1:1. So it does not matter, which one is used as input or output.

Pin assignment



Pin	Assignment
1	Reserved
2	Reserved
3	Reserved
4	GND
5	Reserved
6	Reserved
7	TX A
8	RX B

Connecting a single solar inverter

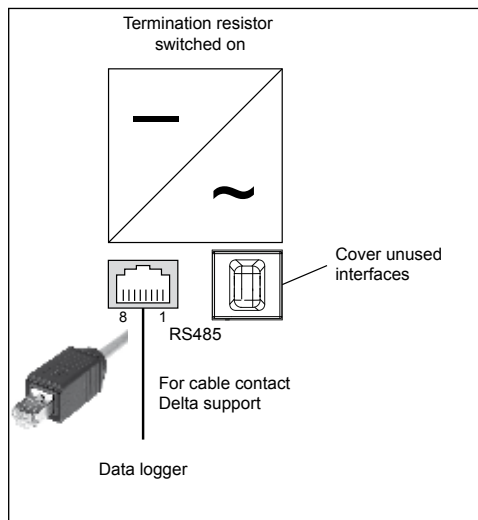


Image 6.9.: Connecting a single solar inverter via RS485 to data logger

The termination resistor can be switched on either during commissioning, see ["Image 6.1.: Mounting orientation"](#), p. 27 or later on (see ["9.1.6 RS485 \(EIA485\)"](#), p. 69).

Installation

Connecting multiple solar inverter

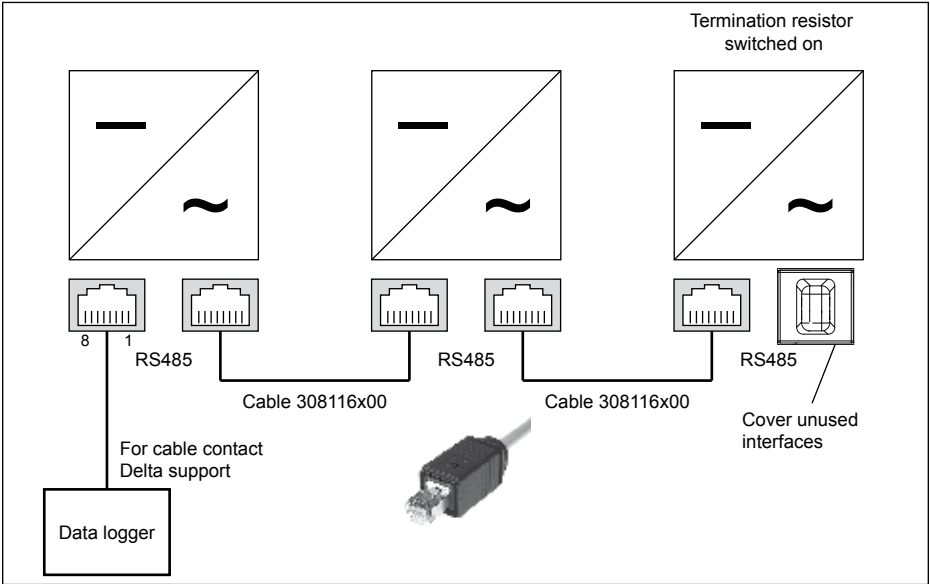


Image 6.10.: Connecting multiple solar inverters via RS485 to data logger

If multiple inverters within a system are to be connected to a monitoring system, the inverters are connected with each other via the RS485 interfaces.

At the last solar inverter on the bus, the termination resistor must be switched on during commissioning, see “Image 6.1.: Mounting orientation”, p. 27.

Cables for RS485 connection	Delta part number
Cable to connect solar inverter with solar inverter	
Harting push pull cable; IP67; one side with blue cable manager, other side with white cable manager	
1.5 m	3081186300
3.0 m	3081186500
5.0 m	3081186600
10.0 m	3081186200
20.0 m	3081186400
Connect cable from last solar inverter to a monitoring gateway device such as Solivia Basic Gateway, Solarlog or Meteocontrol WEB'logger	
Outdoor cable; IP65; with Harting RJ45 push pull and RJ12 plugs	Contact Delta support

If you want to assemble the cables yourself to connect inverter with inverter, you have to use cable managers from Harting (IP67 push pull system cable RJ45).

It is recommended to use a blue cable manager on one side and a white cable manager on the other side.

Cable managers	Harting part number
RJI IP67 Data plug push pull 8-pol white	09 45 145 1500
RJI IP67 Data plug push pull 8-pol blue	09 45 145 1510

HARTING Deutschland GmbH & Co. KG (P.O. 2451, D-32381 Minden; www.harting.com)

Installation

6.3.4 I/O interface

NOTE



At the moment (February 2012), the I/O interface cannot be used. Contact Delta support for further information.

The I/O connector kit is part of the scope of delivery.

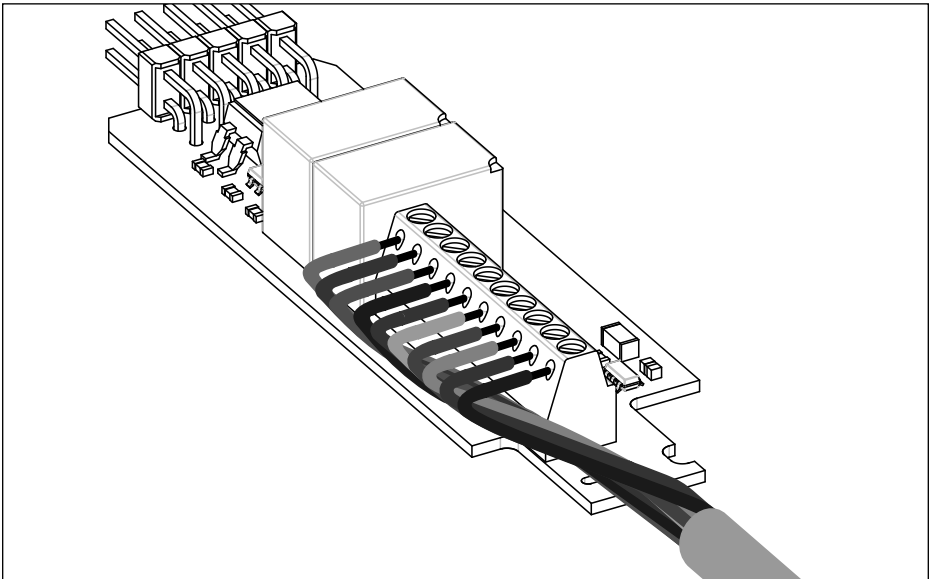


Image 8.11.: Wiring I/O module

Pin assignment

Pin	Designation	Usage
1	2_COM	Relay 2 - common
2	2_NOC	Relay 2 - normally open contact
3	1_COM	Relay 1 - common
4	1_NCC	Relay 1 - normally closed contact
5	1_NOC	Relay 1 - normally open contact
6	A	EPO - wire A
7	B	EPO - wire B
8	IN	reserved
9	5V	reserved
10	GND	reserved

Installation

Mounting the connector

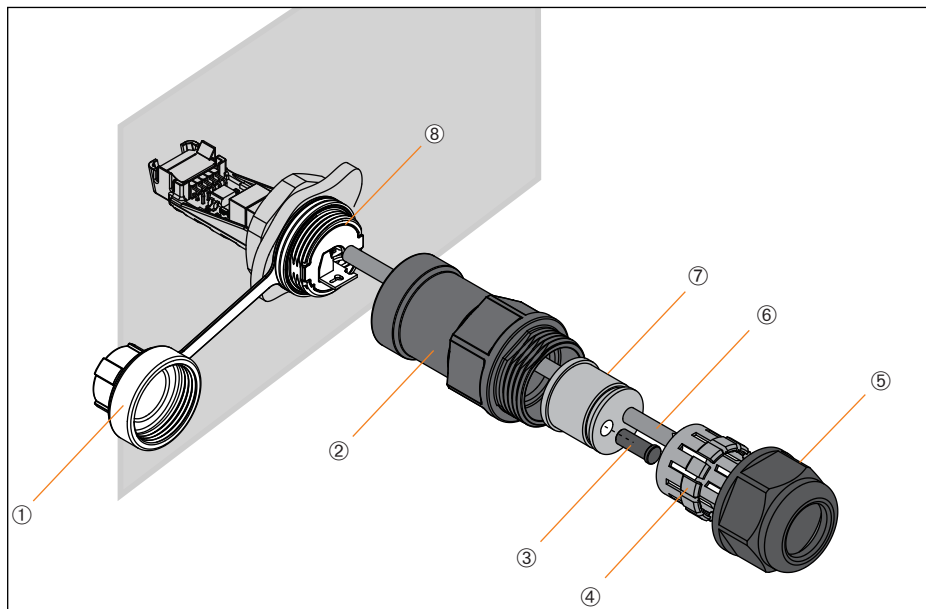


Image 6.12.: Mounting I/O connector

No.	Designation
①	Cover
②	Housing of connector
③	Sealing for unused holes
④	Clamping basket
⑤	Cable gland
⑥	Cable
⑦	Sealing ring
⑧	I/O interface

The two holes for the cable entry are for a cable diameter range from 3.6 to 5.2 mm. Unused holes must be sealed with the sealing ③.

7. Commissioning

7.1 Before you start

7.1.1 Overview

The solar inverter must be installed correctly, see [“6. Installation” on page 27](#).

To understand how to operate the display, see [“4.5.2 Operating the display” on page 15](#).

After first boot up and automatic selftest, the commissioning process guides you step-by-step through the commissioning procedure.

7.1.2 Checklist “Choosing the right commissioning procedure”

This checklist will help you to decide which type of commissioning process you should use.

Task	Relevant commissioning procedure
You want to specify the settings manually and the grid which the solar inverter is connected to is in this list: BE Belgium BUL Bulgaria CZ Czech Republic DE VDE Germany acc. VDE 0126 ES 51 / 48 Hz Spain 51 / 48 Hz ES 51 / 49 Hz Spain 51 / 49 Hz FR France FR ISLAND 60Hz France islands with 60 Hz GR CONTINENT Greece continent (49.5 / 50.5 Hz) GR ISLAND Greece islands (47.5 / 51Hz) IT 50 / 49 Italy 50 / 49 Hz IT 51 / 49 Italy 51 / 49 Hz NL The Netherlands ROM Romania SK Slovakia SL Slovenia PT Portugal UK G59 United Kingdom	“7.2 Standard commissioning” on page 46
You want to specify the settings manually and the grid which the solar inverter is connected to is in this list: DE LVD Germany acc. VDE AR N 4105. DE MVD Germany acc. BDEW. DK LVD Denmark acc. VDE AR N 4105	“7.3 LVD/MVD commissioning” on page 50
You want to load the settings from another solar inverter of the same type because the settings are the same.	“7.4 Commissioning by loading settings from another solar inverter” on page 55
You want to swap a solar inverter by a new one of the same type.	“7.5 Commissioning after swapping solar inverters” on page 59

Commissioning

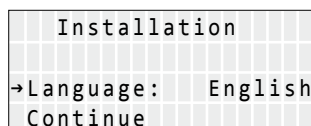
Task	Relevant commissioning procedure
You want to specify the settings manually and the grid which the solar inverter is connected to is not in one of the two above lists.	You can setup a customized country. Please call Delta Solivia Support.

7.2 Standard commissioning

1. Check all plugs and cables for damage and proper fit. If necessary, correct the installation.
2. Turn on the DC switch.
→ The boot process of the solar inverter starts.

After the boot process and the automatic self test, the commissioning procedure of the solar inverter starts and the initial menu **Language** is displayed.

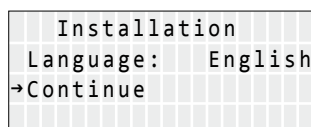
3. Select a language.



Adjustable parameters

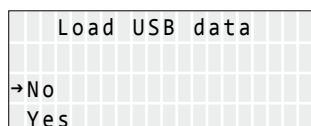
Displaytext	Designation	Description
Language	Language	The language of the display. Czech Danish Dutch English French German Italian Portuguese Romanian Slovak Slovenian Spanish

4. Select **Continue** and press the **ENTER** button.



→ The menu **Load USB data** is displayed.

5. In the menu **Load data**, choose the type of commissioning.



Select **No** for "Manual commissioning".

→ The menu **Grid selection** is displayed.

6. Select a grid.

Load USB data	
→Grid:	DE VDE
Continue	

Grids available for standard commissioning	
Displaytext	
BE	Belgium
BUL	Bulgaria
CZ	Czech Republic
DE VDE	Germany acc. VDE 0126
ES 51 / 48 Hz	Spain 51 / 48 Hz
ES 51 / 49 Hz	Spain 51 / 49 Hz
FR	France
FR ISLAND 60Hz	France islands with 60 Hz
GR CONTINENT	Greece continent (49.5 / 50.5 Hz)
GR ISLAND	Greece islands (47.5 / 51Hz)
IT 50 / 49	Italy 50 / 49 Hz
IT 51 / 49	Italy 51 / 49 Hz
NL	The Netherlands
ROM	Romania
SK	Slovakia
SL	Slovenia
PT	Portugal
UK G59	United Kingdom

7. Select **Continue** and press the **ENTER** button.

→ The menu **Locked power limit** is displayed.

8. When you want to set a power limitation, select **Yes** and press the **ENTER** button.

Locked power limit	
→Yes	
No	

→ When you select **Yes**, the following menu is displayed.

Locked power limit	
→Max power:	_ W
Continue	

Adjustable parameters

Displaytext	Designation	Description
Max power	Maximum power	The maximum power to be fed into the grid. The value can be set in W.

NOTE



When you set a power limitation, fill out the label “The product has been power limited ...” afterwards with a water-proof pen and affix the label on the front of the solar inverter.

NOTE



After commissioning, the set power limitation is displayed in menu **131 View grid setup** (value **MaxPower**).

NOTE



After finishing the commissioning process, the power limitation is locked. To change the power limitation after commissioning, a PIN is needed (see “[9.1.5 Change grid](#)” on page 68).

9. Select **Continue** and press the **ENTER** button.

→ The menu **Mppt** is displayed. As this solar inverter supports only single MPP tracking, the settings cannot be changed.

10. Select **Continue** and press the **ENTER** button.

Mppt	
→Continue	
Mppt:	PV1

→ The menu **Format** is displayed.

11. Set date and time format.

Format	
Continue	
→Date:	DD.MM.YYYY
Time:	12h

Adjustable parameters

Displaytext	Designation	Description
Date	Date format	DD.MM.YYYY DD/NN/YYYY DD-MM-YYYY MM.DD.YYYY MM/DD/YYYY MM-DD-YYYY YYYY.MM.DD YYYY/MM/DD YYYY-MM-DD
Time	Time format	12h 24h

12. Select **Continue** and press the **ENTER** button.

→ The menu **Date and time** is displayed.

13. Set date and time.

Date and time	
Continue	
→Date:	--:--:--
Time:	--:--:pm

14. Select **Continue** and press the **ENTER** button.

→ The menu **RS485** is displayed.

15. Set the RS485 ID and the Baudrate.

RS485	
Continue	
→ID:	1
Baudrate:	19200

Adjustable parameters

Displaytext	Designation	Description
ID	RS485 ID	1 .. 255
Baudrate	Baudrate	2400 4800 9600 19200 38400; default is 19200
Termination	Termination	ON OFF

NOTE



Connecting several solar inverters via RS485

- ▶ When multiple solar inverters are used in an installation, choose a different ID for each solar inverter. Later on, the ID is also used to identify a solar inverter when loading settings or swap data.
- ▶ On the last solar inverter in the series, set the termination to "ON".

16. Select **Continue** and press the **ENTER** button.

→ The final menu is displayed.

ENTER
To quit installation
ESC
To repeat selection

17. To complete commissioning, press the **ENTER** button.

- ☒ Commissioning is completed.

7.3 LVD/MVD commissioning

This chapter describes manual commissioning for all grids except

1. Check all plugs and cables for damage and proper fit. If necessary, correct the installation.
2. Turn on the DC switch.

→ The boot process of the solar inverter starts.

After the boot process and the automatic self test, the commissioning procedure of the solar inverter starts and the initial menu **Language** is displayed.

3. Select a language.

Installation	
→ Language:	English
Continue	

Adjustable parameters

Displaytext	Designation	Description
Language	Language	The language of the display. Czech Danish Dutch English French German Italian Portuguese Romanian Slovak Slovenian Spanish

4. Select **Continue** and press the **ENTER** button.

```

  Installation
  Language:   English
  →Continue

```

→ The menu **Load USB data** is displayed.

5. In the menu **Load USB data**, choose the type of commissioning.

```

  Load USB data
  →No
  Yes

```

Select **No** for “Manual commissioning”.

→ The menu **Grid selection** is displayed.

6. Select a LVD or MVD grid.

```

  Load USB data
  →Grid:      DE LVD
  Continue

```

Grids available for LVD/MVD commissioning

DE MVD	Germany acc. BDEW
DE LVD	Germany acc. VDE AR N 4105
DK LVD	Denmark acc. VDE AR N 4105

→ The menu **PDD** (Power Disconnecting Device) is displayed.

7. Select an option and press the **ENTER** button.

The menu offers three options:

Option	Description
Standard	Loads the MVD/LVD settings recommended by regulations.
OFF	PDD is switched off.
USER	All parameters can be set manually within the limits defined by the MVD/LVD.

Option “USER”

When you selected a **LVD** grid, you have to set these parameters:

Adjustable parameters

Displaytext	Designation	Description
U _{max}	Rise-in-voltage protection U>	110 ... 115%

As defined in VDE AR N 4105, only the rise-in-voltage protection U_{max} shall be designed as 10-minute running mean value protection which prevents the upper voltage limit specified in DIN EN 50160 from being exceeded (monitoring over the power).

When you selected a **MVD** grid, you have to set these parameters:

Adjustable parameters

Displaytext	Designation	Adjustable values	Recommended by MVD
Crit. U _{max}	Rise-in-voltage protection U>>	1.00 ... 1.30 U _n	1.20 U _{ns}
U _{min}	Under-voltage protection U<	0.10 ... 1.00 U _n	0.80 U _{ns}
Crit. U _{min}	Under-voltage protection U<<	0.10 ... 1.00 U _n	0.45 U _{ns}
F _{max}	Rise-in-frequency protection f>	50.0 ... 52.0 Hz	51.5 Hz
F _{min}	Under-frequency protection f>	47.5 ... 50 Hz	47.5
tU _{min}	Delay time for U<	1.5 ... 2.4 s	1.5 ... 2.4 s

- After finishing settings, select **Continue** and press the **ENTER** button.

→ The menu **Locked power limit** is displayed.

- When you want to set a power limitation, select **Yes** and press the **ENTER** button.

Locked power limit	
→ Yes	
No	

→ When you select **Yes**, the following menu is displayed.

Locked power limit	
→ Max power:	_%
Continue	

Adjustable parameters

Displaytext	Designation	Description
Max power	Maximum power	The maximum power to be fed into the grid. The value can be set in %.

NOTE

When you set a power limitation, fill out the label "The product has been power limited ..." afterwards with a water-proof pen and affix the label on the front of the solar inverter.

NOTE

After commissioning, the set power limitation is displayed in menu **131 View grid setup** (value **MaxPower**).

NOTE

After finishing the commissioning process, the power limitation is locked. To change the power limitation after commissioning, a PIN is needed (see "9.1.5 Change grid" on page 68).

10. Select **Continue** and press the **ENTER** button.

→ The menu **Format** is displayed.

11. Set date and time format.

	Format	
	Continue	
→ Date:	DD.MM.YYYY	
Time:	12h	

Adjustable parameters

Displaytext	Designation	Description
Date	Date format	DD.MM.YYYY DD/NN/YYYY DD-MM-YYYY MM.DD.YYYY MM/DD/YYYY MM-DD-YYYY YYYY.MM.DD YYYY/MM/DD YYYY-MM-DD
Time	Time format	12h 24h

12. Select **Continue** and press the **ENTER** button.

→ The menu **Date and time** is displayed.

Commissioning

13. Set date and time.

Date and time									
Continue									
→Date:				:		:			
Time:				:		:			pm

14. Select **Continue** and press the **ENTER** button.

→ The menu **RS485** is displayed.

15. Set the RS485 ID and the Baudrate.

RS485									
Continue									
→ID:									1
Baudrate:									19200

Adjustable parameters

Displaytext	Designation	Description
ID	RS485 ID	1 .. 255
Baudrate	Baudrate	2400 4800 9600 19200 38400; default is 19200
Termination	Termination	ON OFF;

NOTE



Connecting several solar inverters via RS485

- ▶ When multiple solar inverters are used in an installation, choose a different ID for each solar inverter. Later on, the ID is also used to identify a solar inverter when loading settings or swap data.
- ▶ On the last solar inverter in the series, set the termination to "ON".

16. Select **Continue** and press the **ENTER** button.

→ The final menu is displayed.

ENTER									
To quit installation									
ESC									
To repeat selection									

17. To complete commissioning, press the **ENTER** button.

☒ Commissioning is completed.

7.4 Commissioning by loading settings from another solar inverter

CAUTION



When a USB stick is inserted, the degree of protection is reduced.

1. If not already done, save settings from another solar inverter, see ["10.4 Save settings" on page 84](#).
2. Check all plugs and cables for damage and proper fit. If necessary, correct the installation.
3. Turn on the DC switch.

→ The boot process of the solar inverter starts.

After the boot process and the automatic self test, the commissioning procedure of the solar inverter starts and the initial menu **Language** is displayed.

4. Select a language.

```

Installation
→Language:   English
Continue
  
```

Adjustable parameters

Displaytext	Designation	Description
Language	Language	The language of the display.
Czech Dutch English French German Hungarian Italian Portuguese Romanian Slovak Slovenian Spanish		

5. In the menu **Load USB data**, choose the type of commissioning.

```

Load USB data
→Yes
No
  
```

Select **Yes** for "Load USB data".

→ The next menu **Load USB data** is displayed.

Commissioning

6. In the menu **Load USB data**, choose the type of data to be loaded.

Load USB data
→ Load settings
Load swap data

Select **Load settings**.

→ The next menu **Load USB data** is displayed.

7. Insert the USB pendrive into the USB interface at the bottom of the solar inverter and press the **ENTER** button.

Load USB data
Insert USB pendrive and press ENTER

→ A menu is displayed to select the RS485 ID of the solar inverter from which the data shall be loaded.

NOTE



The file with the inverter data must be located in the root directory of the USB pendrive. The RS485 ID is stored in the file name.

8. Choose an ID.

Select RS485 ID
→ ID: ---
Continue

9. Select **Continue** and press the **ENTER** button.

→ Loading of data starts.

After successful loading, a message is displayed.

Load data
Successful
Press ENTER

10. Press the **ENTER** button.

→ The menu **RS485** is displayed.

11. Set the RS485 ID and the baudrate.

RS485	
Continue	
→ ID:	1
Baudrate:	19200

Adjustable parameters

Displaytext	Designation	Description
ID	RS485 ID	1 .. 255
Baudrate	Baudrate	2400 4800 9600 19200 38400; default is 19200
Termination	Termination	ON OFF;

NOTE



Connecting several solar inverters via RS485

- ▶ When multiple solar inverters are used in an installation, choose a different ID for each solar inverter. Later on, the ID is also used to identify a solar inverter when loading settings or swap data.
- ▶ On the last solar inverter in the series, set the termination to "ON".

12. Select **Continue** and press the **ENTER** button.

→ The menu **Format** is displayed.

13. Set date and time format.

Format	
Continue	
→ Date:	DD.MM.YYYY
Time:	12h

Adjustable parameters

Displaytext	Designation	Description
Date	Date format	DD.MM.YYYY DD/NN/YYYY DD-MM-YYYY MM.DD.YYYY MM/DD/YYYY MM-DD-YYYY YYYY.MM.DD YYYY/MM/DD YYYY-MM-DD
Time	Time format	12h 24h

14. Select **Continue** and press the **ENTER** button.

→ The menu **Date and time** is displayed.

7.5 Commissioning after swapping solar inverters

CAUTION



When a USB stick is inserted, the degree of protection is reduced.

1. Check all plugs and cables for damage and proper fit. If necessary, correct the installation.
2. Turn on the DC switch.

→ The boot process of the solar inverter starts.

After the boot process and the automatic selftest, the commissioning procedure of the solar inverter starts and the initial menu **Language** is displayed.

3. Select a language.

```

Installation
→Language:   English
Continue
  
```

Adjustable parameters

Displaytext	Designation	Description
Language	Language	The language of the display. Czech Dutch English French German Hungarian Italian Portuguese Romanian Slovak Slovenian Spanish

4. In the menu **Load data**, choose the type of commissioning.

```

Load USB data
→Yes
No
  
```

Select **Yes** for "Load USB data".

→ The next menu **Load USB data** is displayed.

5. In the menu **Load data**, choose the type of commissioning.

```

Load USB data
→Load swap data
Load settings
  
```

Commissioning

Select **Load settings**.

→ The next menu **Load USB data** is displayed.

6. Insert the USB stick into the USB interface at the bottom of the solar inverter and press the **ENTER** button.

```
Load USB data
Insert USB pendrive
and press ENTER
```

→ A menu is displayed to select the RS485 ID of the solar inverter from which the data shall be loaded.

NOTE



The file with the inverter data must be located in the root directory of the USB pendrive. The RS485 ID is stored in the file name.

7. Choose an ID.

```
Select RS485 ID
→ID:      ---
Continue
```

8. Select **Continue** and press the **ENTER** button.

→ Loading of data starts.

After successful loading, a message is displayed.

```
Successful
Press ENTER
```

9. Press the **ENTER** button.

→ The menu **Format** is displayed.

10. Set date and time format.

```
Format
Continue
→Date:  DD.MM.YYYY
Time:    12h
```


Adjustable parameters

Displaytext	Designation	Description
Date	Date format	DD.MM.YYYY DD/NN/YYYY DD-MM-YYYY MM.DD.YYYY MM/DD/YYYY MM-DD-YYYY YYYY.MM.DD YYYY/MM/DD YYYY-MM-DD
Time	Time format	12h 24h

11. Select **Continue** and press the **ENTER** button.

→ The menu **Date and time** is displayed.

12. Set date and time.

```

  Date and time
  Continue
→Date:  __:__:__
Time:   __:__:__ pm

```

13. Select **Continue** and press the **ENTER** button.

→ The final menu is displayed.

```

ENTER
To quit installation
ESC
To repeat selection

```

14. To complete commissioning, press the **ENTER** button.

☒ Commissioning is completed.

7.6 Next steps

- ▶ When grid is MVD or LVD, several settings for active and reactive power control can be adjusted, see [“9.3 User settings” on page 71](#).
- ▶ The solar inverter offers some optional features, see [“9.4 Options settings” on page 80](#).

NOTE



After finishing all commissioning work, save settings (see [“10.4 Save settings” on page 84](#)) and swap data ([“10.6 Save swap data” on page 85](#)) on a USB stick for later use.

8. Production information

NOTE



All production information are for orientation only. For accounting, refer to the meters and counters provided by the utility.

8.1 Overview

Related menu

The menu **400 Production info** contains actual data and statistics for several values and periods of time. The information are readonly and cannot be edited.

Access

- To access the menu, select **Main menu > Production info**.
- The menu **400 Production info** is displayed.

400 Production info
Feed-in settings
→Actual data
Day statistics

Structure

Submenu		Contents	Description
Number	Title		
4xx	Actual data	Actual data for power, AC, PV1, date & time, L1 .. L3	“8.2 Actual data” on page 63
410	Day statistics	Statistics for AC, PV and ISO	“8.3 Other statistics” on page 64
420	Week statistics		
430	Month statistics		
440	Year statistics		
450	Total statistics		
470	Feed-in settings	Settings for currency and pay per kWh.	“9.2 Production settings” on page 70

Table 10.1.: Structure of menu 400 Production info

8.2 Actual data

Related menu

The actual production data are in the menu **411 Actual data**.

Access

► To access the menu, go to **Main menu > Production info > Actual data**.

→ The menu **411 Actual data** is displayed.

411 Actual overview
Actual isolation
→ Actual data
Day statistics

Structure

Submenu		Contents	Sample display
Number	Title		
411	Actual overview	Actual values. Current operation state (see “11. Diagnostics and maintenance” on page 88)	<div>411 Actual overview</div> <div>Now: _W</div> <div>Day: _Wh</div> <div>Normal operation</div>
412	Actual data AC	Comparison of L1, L2, L3 Screens for: voltage, frequency, current, active power, reactive power, cos ϕ , DC injection	<div>412 Actual data AC</div> <div>L1 Voltage: _V</div> <div>L2 Voltage: _V</div> <div>L3 Voltage: _V</div>
413	Actual data L1	Separate data for L1, L2, L3 Data for: voltage, frequency, current, active power, reactive power, cos ϕ , DC injection	<div>413 Actual data L1</div> <div>Voltage: _V</div> <div>Freq.: _._Hz</div> <div>Current: _._A</div>
414	Actual data L2		
415	Actual data L3		
416	Actual data PV	Data for: voltage, current	<div>416 Actual data PV</div> <div>PV Voltage: _V</div> <div>PV Current: _._A</div>

Production information

Submenu		Contents	Sample display
Number	Title		
41A	Actual date&time	Shows the actual date and time. To set the values, use menu [110 Date & time], see "9.1.2 Date and time" on page 67.	<div>41A Actual date&time</div> <div>Date: 09/14/2011</div> <div>Time: 03:15:22pm</div>
41B	Actual isolation	Data for: maximum and minimum isolation resistance	<div>41B Actual isolation</div> <div>R ISO max: _kΩ</div> <div>R ISO min: _kΩ</div>

Table 10.2.: Structure of menu 410 Actual data

8.3 Other statistics

Related menus and access

Menu	Access
420 Day statistics	Main menu > Production info > Day statistics
430 Week statistics	Main menu > Production info > Week statistics
440 Month statistics	Main menu > Production info > Month statistics
450 Year statistics	Main menu > Production info > Year statistics
460 Total statistics	Main menu > Production info > Total statistics

Table 10.3.: Statistic menus

420 Day statistics
Day stat. AC
→Day stat. PV
Day stat. ISO

The production statistics for day, week, month, year and total production time provide the same types of data.

Structure

The structure is shown for **420 Day statistics**. The structure of the other menus is the same.

Submenu		Contents	Sample display
Number	Title		
421	Day stat. AC	<p>Statistics for: energy, run-time, revenue,</p> <p>To configure settings for revenue, see “9.1 Installation settings” on page 66.</p> <p>Comparison of L1, L2, L3:</p> <p>Screens for: frequency range, maximum current, voltage range, maximum active power, maximum/minimum reactive power, maximum/minimum power factor capacitive/inductive</p>	<div>421 Day stat. AC</div> <div>Energy: Wh</div> <div>Runtime: h</div> <div>Revenue: EUR</div> <hr/> <div>421 Day stat. AC</div> <div>L1 Δf: . / Hz</div> <div>L2 Δf: . / Hz</div> <div>L3 Δf: EUR</div>
422	Day stat. PV	<p>Statistics for: maximum current, maximum voltage, maximum active power</p>	<div>422 Day stat. PV</div> <div>PV I_{max}: A</div> <div>PV U_{max}: V</div> <div>PV P_{max}: W</div>
423	Day stat. ISO	<p>Statistics for: maximum/minimum isolation resistance</p>	<div>423 Day stat. ISO</div> <div>Riso max: kΩ</div> <div>Riso min: kΩ</div>

Table 10.4.: Structure of menu 420 Day statistics

9. Settings

This chapter describes how to set the adjustable features.

- Installation settings
- Production settings
- User settings (for LVD and MVD grids only)
- Options settings

To understand how to operate the display, see “4.5.2 Operating the display”, p. 15.

9.1 Installation settings

Adjustable settings

- Language
- Date, time
- Date format, time format
- Backlight, contrast, scroll time
- Grid selection
- RS485

9.1.1 Language

Enclosing menu:

100 Installation settings

Access to menu:

Main menu > Install settings

- or -

Press the **Esc** and the **Down** button at the same time.

Sample screen:

```
100 Install settings
  RS485
→Language:  English
  Date & time
```

Adjustable parameters

Displaytext	Designation	Description
Language	Language	The language of the display. Czech Dutch English French German Hungarian Italian Portuguese Romanian Slovak Slovenian Spanish

9.1.2 Date and time

Enclosing menu:

110 Date & time

Access to menu:

Main menu > Install settings > Date & time

Sample screen:

```
110 Date & time
Format
→Date:    11/17/2012
Time:     03:15:22pm
```

9.1.3 Date and time format

Enclosing menu:

111 Format

Access to menu:

Main menu > Install settings > Date & time > Format

Sample screen:

```
111 Format
→Date:    MM/DD/YYYY
Time:     03:03:25pm
```

Adjustable parameters

Displaytext	Designation	Description
Date	Date format	DD.MM.YYYY DD/MM/YYYY DD-MM-YYYY MM.DD.YYYY MM/DD/YYYY MM-DD-YYYY YYYY.MM.DD YYYY/MM/DD YYYY-MM-DD
Time	Time format	12h 24h

9.1.4 Backlight, contrast

Enclosing menu:

120 Display settings

Access to menu:

Main menu > Install settings > Display settings

Sample screen:

```
120 Display settings
→Backlight:    auto
Contrast:      10
```

Settings

Adjustable parameters

Displaytext	Designation	Description
Backlight	Backlight of the display	Auto On Auto = The backlight switches on, when a display button is pressed. On = The backlight is always switched on.
Contrast	Contrast of the display	5 .. 10

9.1.5 Change grid



CAUTION



Changing the grid always means to start a new commissioning from scratch, see [“7. Commissioning”, p. 45.](#)

- Do always contact the Delta Support Team, **before** changing the grid!

NOTE



You always need a PIN to enter the grid selection mode. Each time, you want to select a new grid, you need a new PIN. The Delta Support Team will provide you a PIN on request.

To get a PIN you have to provide a key. The key can be found in the menu **132 Change grid**.

1. For the key, go to **Main menu > Install settings > Grid selection > Change grid**.

```
132 Change grid
Grid:          DE VDE
Key:          #####
PIN:  _ _ _ _ Confirm
```

The key has 11 characters and consists of numbers and letters.

2. Contact the Delta Support Team to get the 4-digit PIN.
3. After you received the PIN, go to menu **132 Change grid** press the **ENTER** button.
 - The first digit of the PIN is flashing.
4. Use the **UP/Down** buttons to set the digit and the **ENTER** button to alter to the next digit.
 - After entering the complete PIN, the word **Confirm** is flashing.


```

132 Change grid
Grid:      DE VDE
Key:      #####
PIN: 1234 Confirm

```

5. To confirm, press the **ENTER** button.

→ The menu **Installation** is displayed.

```

Installation
→Language: English
Continue

```

6. Start commissioning the solar inverter, see “7. Commissioning”, p. 45.

9.1.6 RS485 (EIA485)

Enclosing menu:

150 RS485

Access to menu:

Main menu > Install settings > RS485

Sample screen:

```

150 RS485
ID:      1
→Baudrate: 19200
Termination: OFF

```

Adjustable parameters

Displaytext	Designation	Description
ID	RS485 ID	1 .. 255
Baudrate	Baudrate	2400 4800 9600 19200 38400; default is 19200
Termination	Termination	ON OFF

NOTE



Connecting several solar inverters via RS485

- ▶ Choose a different ID for each solar inverter.
- ▶ On the last solar inverter in the series, set the termination to “ON”.

9.2 Production settings

Enclosing menu:
Access to menu:
Sample screen:

450 Production settings
Main menu > Production info > Feed-in settings

470 Feed-in settings			
Revenue			
→Currency:		EUR	
Pay per kWh:		_ . _ _	

Adjustable parameters		
Displaytext	Designation	Description
Currency	Currency	No predefined values.
EUR / kWh	Pay per kWh	The value "EUR" changes when the parameter Currency is changed. The pay per kWh is needed to calculate the revenue.
Revenue		No predefined values.

9.3 User settings

NOTE



This chapter is only available for LVD or MVD grids. For all other grids, this menu is not displayed.

9.3.1 Overview

The menu **User settings** offers some features to control the production of active and reactive power.

Mode	Available for		Description
	LVD	MVD	
Active power control			
Power reduction	x	x	To reduce the maximum power production.
Power vs. frequency	x	x	To set the power gradient in dependency of the frequency
Reactive power control			
Constant cos φ	x	x	To set a fixed cos φ (inductive or capacitive)
cos φ (p)	x	x	To set a cos φ (inductive or capacitive) in dependency of the active power ratio P/P _n
Constant reactive power		x	To set the reactive power ratio Q/S _n . For MVD grids only.
Q (U)		x	To set the reactive power ratio Q/S _n in dependency of the voltage U. For MVD grids only.
Fault ride through (FRT)		x	To set the feed-in current in case of a symmetric (= 3-phase) or asymmetric (= 2-phase) failure.

Settings

9.3.2 Active power control

9.3.2.1 Overview

Mode	Available for		Description
	LVD	MVD	
Power reduction	x	x	To reduce the maximum power production
Power vs. frequency	x	x	To set the power gradient in dependency of the frequency

9.3.2.2 Power reduction

Description

This mode is available for LVD and MVD grids.

This mode allows to set the maximum allowable active power in percent of the maximum power of the solar inverter.

Enclosing menu:

511 Power reduction

Access to menu:

Main menu > User settings > Active PwCtrl > Power reduction

Sample screen:

511 Power reduction
→Max. power: _%

Adjustable parameters

Displaytext	Designation	Description
Max. power	Maximum active power	Limits the active power reduction to the adjusted value.

9.3.2.3 Power vs. frequency

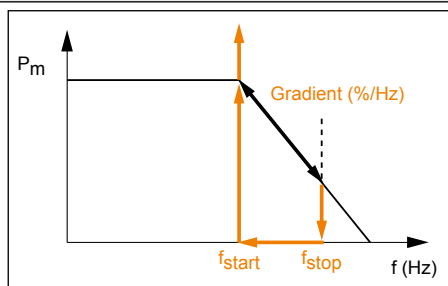
Description

This mode is available for LVD and MVD grids.

This mode allows the power to be set as a function of the frequency.

The behavior of the solar inverter is different for LVD and MVD grids (according to German regulations).

Operating behavior in LVD grids



Variant 1 (black arrow): Actual frequency is between f_{start} and f_{stop}

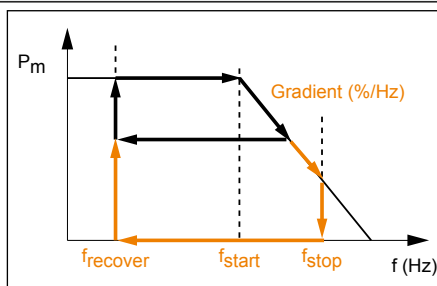
When the actual frequency exceeds f_{start} , the value of the actual power P_m is automatically saved and power reduction starts.

As long as the actual frequency keeps above f_{start} and below f_{stop} , the power reduction is adjusted according to the gradient (black arrow).

Variant 2 (orange arrows): Actual frequency exceeds f_{stop}

When the actual frequency exceeds f_{stop} , power production is switched off. It stays switched off until the actual frequency falls below f_{start} . When it falls below f_{start} , power production is started again but limited to the saved value P_m . When the actual power reduction exceeds P_m , the increase is automatically limited to 10% of P_m per minute.

Operating behavior in MVD grids



Variant 1 (black arrows): Actual frequency is between f_{start} and f_{stop}

When the actual frequency exceeds f_{start} , the value of the actual power P_m is automatically saved and power reduction starts.

As long as the actual frequency keeps rising but does not reach f_{stop} , the power reduction is adjusted according to the gradient.

When the actual frequency falls again, power reduction remains constant until the actual frequency reaches $f_{recover}$. When it reaches $f_{recover}$, power reduction is switched off and power production is set back to the saved value P_m .

Variant 2 (orange arrows): Actual frequency exceeds f_{stop}

When the actual frequency exceeds f_{stop} , power production is switched off. It stays switched off until the actual frequency falls below $f_{recover}$. When it reaches $f_{recover}$, power production is set back to the saved value P_m .

Settings

Enclosing menu:

512 Power vs freq

Access to menu:

Main menu > User settings > Active PwCtrl > Power vs freq

Sample screen:

512	P	w	e	r		v	s		f	r	e	q		
	R	e	c	o	v	e	r		f	r	:		.	
														H
														z
→	S	t	a	r	t		f	r	e	q	:		.	
														H
														z
	S	t	o	p		f	r	e	q	:		.		
														H
														z

Adjustable parameters

Displaytext	Designation	Adjustable values	Description
Start freq	Start frequency	50.00 .. 55.00 Hz	Default: 50.20 Hz Frequency at which power reduction starts.
Stop freq	Stop frequency	50.00 .. 55.00 Hz	Default: 51.50 Hz Frequency at which power production is switched off.
Recover fr.	Recover frequency	45.00 .. 55.00 Hz	Default: 50.05 Hz Frequency at which power production is switched on again. This parameter is only available for MVD grids.
Gradient	Gradient	0 .. 150 %	Default: 40 % Power adaption in percent per Hz.

9.3.3 Reactive power control

9.3.3.1 Introduction

Mode	Available for		Description
	LVD	MVD	
Constant $\cos \varphi$	x	x	To set a fixed $\cos \varphi$ (inductive or capacitive)
$\cos \varphi$ (P)	x	x	To set a $\cos \varphi$ (inductive or capacitive) in dependency of the active power ratio P/P_n
Constant reactive power		x	To set the reactive power ratio Q/S_n . For MVD grids only.
Q (U)		x	To set the reactive power ratio Q/S_n in dependency of the voltage U. For MVD grids only.

All modes can be found in the menu **520 Reactive PwCtrl**.

Only one of the modes can be activated.

Access and activation

- To access the menu, go to **Main menu > User settings > Reactive PwCtrl**.
- In the parameter **mode** select the mode of reactive power control or select “disabled” when you don’t want to use reactive power control.
 - The parameters available in the menu are adjusted according to the selected mode.

9.3.3.2 Constant $\cos \varphi$

Description

This mode is available for LVD and MVD grids.

This mode allows a constant $\cos \varphi$ to be set.

Enclosing menu:

520 Reactive PwCtrl

Select mode:

Fix cos phi

Sample screen:

520 Reactive PwCtrl									
→ Mode:		Fix cos phi							
Cos phi:		ind 0.90							

Settings

Adjustable parameters

Displaytext	Designation	Adjustable values	Description
Cos phi	cos φ	inductive capacitive 1 ... 0.8	Sets the cos φ to the adjusted value.

9.3.3.3 cos φ (P)

Description

This mode is available for LVD and MVD grids.

With this mode a cos φ can be assigned to a power ratio P/P_n .

Four combinations of power ratio values and cos φ can be set. The values for power ratio and cos φ are organized in pairs: The cos φ "B" belongs to power ratio B, cos φ "C" belongs to power ratio "C".

The following curve is an example how the values could be set and how the operating behavior is:

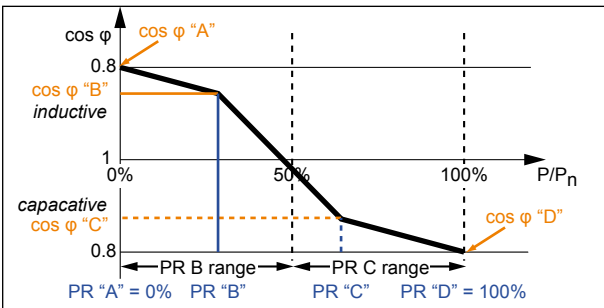


Image 11.13.: Curve cos φ (P), example

inductive, capacitive, PR [= Power ratio] range

Enclosing menu:

520 Reactive PwCtrl

Select mode:

Cos phi (P)

Sample screen:

```
520 Reactive PwCtrl
D Cos phi: cap 0.90
→Mode: Cos phi (P)
A Cos phi: cap 1.00
```

Adjustable parameters

Displaytext	Designation	Adjustable values	Description
B Power ratio	Power ratio B	1 .. 50 %	The power ratio P/P_n can be set in the given range.
C Power ratio	Power ratio C	51 .. 99 %	

Displaytext	Designation	Adjustable values	Description
D .. A cos phi cos φ A.. D		inductive capacitive 1 ... 0.8	The 4 values can be set independent of each other.

9.3.3.4 Constant reactive power

This feature allows a constant cos reactive power to be set.

520 Reactive PwCtrl

Fix Q

```
520 Reactive PwCtrl
→Mode:          Fix Q
  0/Sn          ind  %
```

Displaytext	Designation	Adjustable values	Description
Q/Sn	Ratio Q/S _n	inductive capacitive -60 ... +60 %	Reactive power ratio in relation to apparent power.

9.3.3.5 Q (U)

Description

This feature is available for MVD grids only.

This feature allows the reactive power ratio Q/S_n to be assigned to a voltage U.

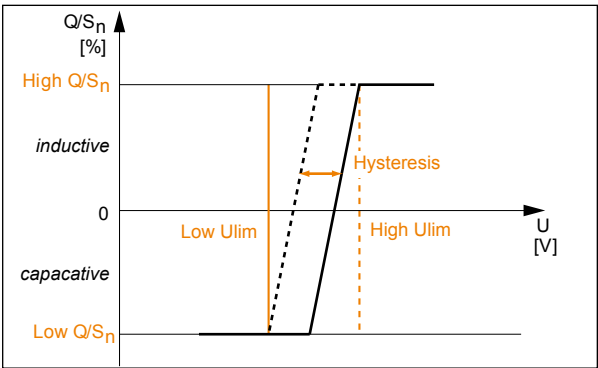


Image 11.14.: Curve Q(U), example

Enclosing menu:

520 Reactive PwCtrl

Select mode:

U(Q)

Sample screen:

520	Reactive	PwCtrl	1
Delay time:	__.	__s	
→ Mode:		U(Q)	
Low Ulim		__V	

Adjustable parameters

Displaytext	Designation	Adjustable values	Description
Low Q/S _n	Low Q/S _n	0 ... 100% inductive capacitive	Reactive power ratio in relation to apparent power, lower and upper limit
High Q/S _n	High Q/S _n	0 ... 100% inductive capacitive	
Low Ulim	Low U limit	184 ... 230 V	Lower voltage limit
High Ulim	High U limit	231 ... 266 V	Upper voltage limit
Hysteresis	Hysteresis	0 .. 50 V	
Delay time	Delay time	0 ... 655,35 s	

9.3.4 Fault ride through (FRT)

Description

This feature is available for MVD only.

Enclosing menu:

530 FRT settings

Access to menu:

Main menu > User Settings > FRT settings

Sample screen:

530 FRT settings			
Max asym cur::	---	%	
→ Mode:		ON	
K factor		2	

Adjustable parameters

Displaytext	Designation	Adjustable values	Description
Mode	Mode	ON OFF	Switches the feature on and off.
K factor	K factor	0 .. 10	
DeadBand V _l	Dead band, lower voltage limit	184 .. 230 V	Lower voltage limit of dead band
DeadBand V _h	Dead band, upper voltage limit	231 .. 266 V	Upper voltage limit of dead band
FRT delay t	FRT delay time	0.01 ... 5 s	When the voltage gets back into the deadband, the maximum symmetric/asymmetric current is still fed in for the given delay time.
Max sym. I	Maximum symmetric current	0 ... 100%	Maximum reactive current in case of a symmetric (= 3-phase) failure
Max asym. I	Maximum asymmetric current	0 ... 100%	Maximum reactive current in case of a asymmetric (= 2-phase) failure

9.4 Options settings

Adjustable settings

- Isolation and grounding monitoring

9.4.1 Isolation and grounding monitoring

Description

The solar inverter has an isolation and grounding monitoring on the DC side.

The isolation monitoring has two modes:

- ISO Error
- ISO Warning

If you need to connect the positive or negative pole of the PV system to the ground to meet requirements set out by the module manufacturer, the grounding can be monitored. The grounding monitoring has four modes:

- – GND Error
- – GND Warning
- + GND Error
- + GND Warning

The solar inverter is factory-set to **ISO Warning** mode on delivery.

Description of the monitor modes:

Monitoring mode	Description
ISO/GND off	Monitoring is switched off.
xxx Error	In the event of an isolation fault, the solar inverter is disconnected from the grid.
xxx Warning	In the event of an isolation fault, the solar inverter indicates the fault but is not disconnected from the grid.

Enclosing menu:

Access to menu:

Sample screen:

230 Grounding

Main menu > Options > Grounding

230	Grounding
→PV:	ISO warning

Adjustable parameters

Displaytext	Designation	Adjustable values
PV	Monitoring for PV	ISO Error ISO Warning – GND Error – GND Warning + GND Error + GND Warning ISO/GND off

9.5 Standard menu

Enclosing menu:

800 Standard menu

Access to menu:

Main menu > Standard menu

Sample screen:

800	Standard menu
→Standard menu: 411	

Adjustable parameters

Displaytext	Designation	Description
Standard menu	Standard menu	<p>A standard menu can be set, which is shown automatically when the display buttons are not used for a given time. When the standard display is shown, using the Esc button opens the main menu.</p> <p>The standard menu ist factory-set to 411 Actual over-view. This menu displays the actual data and actual operating messages.</p> <p>The number must be a valid menu number.</p>

10. Saving and loading data and settings

10.1 Before you start

NOTE



Load swap data is only possible during installation.

To understand how to operate the display, see “[4.5.2 Operating the display](#)”, p. 15.

Per default the USB interface is disabled. Before use it has to be enabled and after use disabled again, see “[10.2 Enabling/Disabling USB interface](#)”, p. 82.



CAUTION



When a USB stick is inserted, the degree of protection is reduced.

10.2 Enabling/Disabling USB interface

Before the USB interface can be used, it has to be enabled!

After the USB interface has been used, it has to be disabled!

10.2.1 Enabling the USB interface

1. In the display, go to **Main menu > USB features > State**.

300	USB features
	Service
→State:	disabled
	Firmware update

2. Press the **ENTER** button.
 - The value **disabled** is flashing.

- Press the **Up/Down** buttons to change the value to **enabled**.

```

300 USB features
Service
→State:      enabled
Firmware update

```

- Press the **ENTER** button to apply the value.

- ☒ The USB interface is enabled.

10.2.2 Disabling the USB interface

- In the display, go to **Main menu > USB features > State**.

```

300 USB features
Service
→State:      enabled
Firmware update

```

- Press the **ENTER** button. The value **enabled** is flashing.
- Use the **Up/Down** buttons to change the value to **disabled**.

```

300 USB features
Service
→State:      disabled
Firmware update

```

- Press the **ENTER** button to apply the value.

- ☒ The USB interface is disabled.

10.3 Firmware update

The firmware can be updated via USB interface:

- Enable the USB interface (see “[10.2 Enabling/Disabling USB interface](#)”, p. 82).
- Insert the USB stick into the USB interface.
- In the display, go to **Main menu > USB features > Firmware update**.

```

300 USB features
State:      disabled
→Firmware update
Save settings

```

Saving and loading data and settings

4. Press the **ENTER** button. The firmware update starts.
5. After successful download (100 %), confirm by pressing the **Esc** button.
6. Remove the USB stick.
7. Disable the USB interface (see [“10.2 Enabling/Disabling USB interface”, p. 82](#)).
8. Restart the Solar Inverter.

After restart, the firmware update is automatically active.

10.4 Save settings

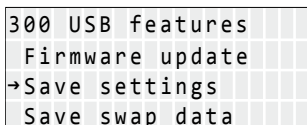
The settings of the solar inverter can be saved to load them into another solar inverter of the same type and on which the same settings can be used.

The saved settings include.

- Grid settings
- User settings
- Display settings
- Production settings

Save the settings as follows:

1. Enable the USB interface ([“10.2 Enabling/Disabling USB interface”, p. 82](#)).
2. Insert the USB stick into the USB interface.
3. In the display, go to **Main menu > USB features > Save settings**.



4. Press the **ENTER** button. The saving process starts.
5. After successful saving (100 %), confirm by pressing the **Esc** button
6. Remove the USB stick.
7. Disable the USB interface (see [“10.2 Enabling/Disabling USB interface”, p. 82](#)).

10.5 Load settings

The settings of another solar inverter of the same type and with the same settings can be loaded to simplify the setting procedure. To save settings, see [“10.4 Save settings”, p. 84](#).

Load the settings as follows:

1. Enable the USB interface ("[10.2 Enabling/Disabling USB interface](#)", p. 82).
2. Insert the USB stick into the USB interface.
3. In the display, go to **Main menu > USB features > Load settings**.

300	USB	features
	Create	reports
→	Load	settings
	Service	

4. Press the **ENTER** button. The loading process starts.
5. After successful loading (100 %), confirm by pressing the **Esc** button
6. Remove the USB stick.
7. Disable the USB interface (see "[10.2 Enabling/Disabling USB interface](#)", p. 82).

10.6 Save swap data

NOTE



In this chapter "swapping" is used in the meaning of replacing a damaged solar inverter by a new one of the same type without changing the installation, e. g. of the modules.

Swapping is always done only after consultation with Delta Solar Support. They will arrange a procedure with you.

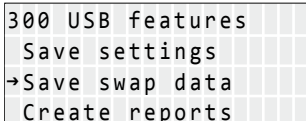
The saved data include:

- Grid settings
- User settings
- Display settings
- Production settings
- RS485 ID number
- Statistics
- Date of first installation

Save the swap data as follows:

Saving and loading data and settings

1. Enable the USB interface (see “[10.2 Enabling/Disabling USB interface](#)”, p. 82).
2. Insert the USB stick into the USB interface.
3. In the display, go to **Main menu > USB features > Save swap data**.



```
300 USB features
  Save settings
→ Save swap data
  Create reports
```

4. Press the **ENTER** button. The saving process starts.
5. After successful saving (100 %), confirm by pressing the **Esc** button
6. Remove the USB stick.
7. Disable the USB interface (see “[10.2 Enabling/Disabling USB interface](#)”, p. 82).

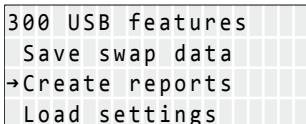
10.7 Create reports

The reports include:

- Firmware/model serial number
- Statistics, events, comparison statistics/events
- Internal logs
- AT reports
- MVD/LVD reports

Save the reports as follows:

1. Enable the USB interface (see “[10.2 Enabling/Disabling USB interface](#)”, p. 82).
2. Insert the USB stick into the USB interface.
3. In the display, go to **Main menu > USB features > Create reports**.



```
300 USB features
  Save swap data
→ Create reports
  Load settings
```

4. Press the **ENTER** button. The saving process starts.
5. After successful saving (100 %), confirm by pressing the **Esc** button
6. Remove the USB stick.
7. Disable the USB interface (see ["10.2 Enabling/Disabling USB interface"](#), p. 82).

10.8 Service

This function is for service purposes. Delta support will contact you when it is necessary to use this function.

11. Diagnostics and maintenance

11.1 Diagnostics

Enclosing menu:

600 Diagnostic&Alarm

Access to menu:

Main menu > Diagnostic&Alarm

Sample screen:

600 Diagnostic&Alarm
→ Internal log
Report LVD

Adjustable parameters

Displaytext	Designation	Description
Internal log	Internal error log	A log for all internal errors, see „ 11.1.2 Internal log “ on page 90
IT Autotest	Italien autotest	Italian autotest according Italian regulations. Only available when the grid is set to “IT 50 / 49 Hz” or “IT 51 / 49 Hz”, see „ 11.1.1 IT Autotest (for Italy only) “ on page 88.
Report LVD	Report for LVD grids	Report according LVD. Only available when the grid is set to a LVD grid.
Report MVD	Report for MVD grids	Report according MVD. Only available when the grid is set to a MVD grid.

11.1.1 IT Autotest (for Italy only)

Description

IT Autotest is only available when the grid is set to **IT 50 / 49 Hz** or **IT 51 / 49 Hz**.

The solar inverter is supplied with an autotest function to verify the correct operation of the interface protection.

The solar inverter will connect to the grid only if the latest overall autotest result is **PASS**.

Each of the three AC phases (L1, L2, L3) is tested for:

- Overvoltage test (OVT)
- Undervoltage test (UVT)
- High frequency test (HFT)
- Low frequency test (LFT)

After completion of the auto test, the overall test results are shown.

The results will be displayed for all three phases (L1, L2, L3). Use the **Up/Down** buttons to scrollthrough the autotest result.

If during the autotest a generic error occurs, or the user interrupts the test with the Esc button, the autotest is canceled with the overall autotest result **FAIL**. The test report then shows "0" as test values and "FAIL" as test result.

NOTICE

The following displays are examples only. The real autotest result may be different.

```
611 AT report 1
Result:      FAIL
12.10.2011 09:23:35
IT FW
```

```
611 AT report 1
L1 OVT:      PASS
Set: 262V<0.10s
Test: 220V 0.08s
```

```
611 AT report 1
L1 UVT:      FAIL
Set: 186V<0.20s
Test: 220V 0.18s
```

```
611 AT report 1
L1 HFT:      PASS
Set: 50.30Hz<0.10s
Test: 50.01Hz 0.08s
```

```
611 AT report 1
L1 LFT:      PASS
Set: 49.70Hz<0.10s
Test: 50.01Hz 0.08s
```

The results for the phases L2 and L3 are displayed in the same way.

Enclosing menu:

600 Diagnostic&Alarm

Access to menu:

Main menu > Diagnostic&Alarm > IT Autotest

Sample screen:

```
600 Diagnostic&Alarm
→IT Autotest
Internal log
```

11.1.2 Internal log

Description

The internal log provides information about the last error occurred.

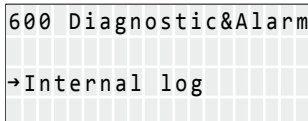
Enclosing menu:

600 Diagnostic&Alarm

Access to menu:

Main menu > Diagnostic&Alarm > Internal log

Sample screen:



A screenshot of a menu interface with a grid background. The text '600 Diagnostic&Alarm' is at the top. Below it, '→Internal log' is displayed.

11.1.3 Report LVD

Description

According to Low Voltage Directive, "Report LVD" shows the last five events. Only available when the grid is set to a LVD grid.

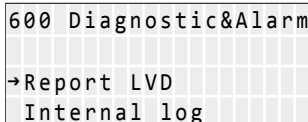
Enclosing menu:

600 Diagnostic&Alarm

Access to menu:

Main menu > Diagnostic&Alarm > Report LVD

Sample screen:



A screenshot of a menu interface with a grid background. The text '600 Diagnostic&Alarm' is at the top. Below it, '→Report LVD' and 'Internal log' are displayed.

11.1.4 Report MVD

Description

According to Middle Voltage Directive, "Report MVD" shows the last five events. Only available when the grid is set to a MVD grid.

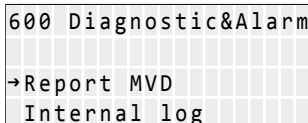
Enclosing menu:

600 Diagnostic&Alarm

Access to menu:

Main menu > Diagnostic&Alarm > Report MVD

Sample screen:



A screenshot of a menu interface with a grid background. The text '600 Diagnostic&Alarm' is at the top. Below it, '→Report MVD' and 'Internal log' are displayed.

11.2 LED and display messages

Both the LEDs and the display are used to show messages. The LEDs show the type of message. In the display, a short text is shown that describes the message more detailed.

The table shows the different types of messages.

LED Status	Type of message	Description
<div> <div>●</div> Operation <div>○</div> Earth Fault <div>○</div> Failure </div>	Normal operation.	No events or failures.
<div> <div>⦿</div> Operation <div>○</div> Earth Fault <div>○</div> Failure </div>	Limited operation.	Events that have an influence on the production yield but are not failures. Feed-in into grid is continued.
<div> <div>●</div> Operation <div>○</div> Earth Fault <div>⦿</div> Failure </div>	Warning.	Events or internal failures that have an influence on the production yield. Additional message in display. Feed-in into grid is continued.
<div> <div>○</div> Operation <div>○</div> Earth Fault <div>●</div> Failure </div>	Error.	Events or internal failures that have an influence on the production yield. Additional message in display. Feed-in into grid is stopped.
<div> <div>⦿</div> Operation <div>⦿</div> Earth Fault <div>○</div> Failure </div>	External isolation warning. Grounding warning.	Isolation is too low or PV grounding is not correct. Feed-in into grid is continued.
<div> <div>○</div> Operation <div>●</div> Earth Fault <div>○</div> Failure </div>	External isolation error.	Isolation is too low or PV grounding is not correct. Feed-in into grid is stopped.







The current operation state is displayed in the 4th line of menu **411 Actual overview**.

411	Actual	overview	
Now:			_W
Day:			_Wh
Normal	operation		



The concept of the solivia inverter distinguishes external **events**, **internal failures** and **earth faults**.

- Events come from outside the inverter and have an influence on the operating behavior of the inverter. For each defined event a single-line message is displayed in plain text in menu **411 Actual overview**, e.g. "PV power too low". Additionally, the LEDs display the type of event: warning or error.
- For each defined internal failure a single-line message is displayed in menu **411 Actual overview**. The message consists of the type of internal failure (warning or error) and a 3-digit number, e.g. "Warning 108". Additionally, the LEDs display the type of event: warning or error.
- When isolation or grounding monitoring is activated (see [„9.4.1 Isolation and grounding monitoring“ on page 80](#)), earth faults are displayed.

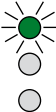



11.2.1 LED and display warning/error messages

LED status	Display message	Description of message Troubleshooting
  	External fan warning	External fan does not work properly. ▶ Contact Delta Support.
	Warning ###	Internal failure ("Warning" + 3-digit number) ▶ Contact Delta Support.
  	L1 Voltage failure L2 Voltage failure L3 Voltage failure	AC overvoltage or undervoltage phase L1, L2 or L3. ▶ Check the grid voltage in display (menu 412 Actual data AC). ▶ If no voltage is present, check automatic circuit breaker.
	L1 Frequency failure L2 Frequency failure L3 Frequency failure	AC high or low frequency phase L1, L2 or L3. ▶ Check the grid frequency in display (menu 412 Actual data AC). ▶ If no voltage is present, check automatic circuit breaker.
	L1 DC Inj. failure L2 DC Inj. failure L3 DC Inj. failure	DC current injection error phase L1, L2 or L3. ▶ Restart solar inverter. If the fault continues to exist, contact your service technician.
	L1 Islanding L2 Islanding L3 Islanding	Frequency shifting error phase L1, L2 or L3. ▶ Check grid condition with utility. ▶ Check installation. ▶ Restart solar inverter. If the fault continues to exist, contact your service technician.
	PV power too low	Solar power too low. Insufficient insolation (dawn/twilight). ▶ Check PV cell voltage in display (menu 416 Actual data PV).

Diagnostics and maintenance

LED status	Display message	Description of message
		Troubleshooting
	Auto test failure	Failure during Italian auto test. For Italy only. ▶ Repeat auto test.
	Error ###	Internal failure ("Error" + 3-digit number) ▶ Contact Delta Support.
	PV1 ISO startup warn	Startup isolation too low. ▶ Check isolation resistance on the DC side of the PV modules.
	PV1 ISO running warn	Running isolation < 150 kΩ. ▶ Check isolation resistance on the DC side of the PV modules.
	PV1+ Grounding warn PV1- Grounding warn	PV1+/PV1- not correctly grounded. ▶ Check GND connection. ▶ Check fuse in GND connection. ▶ If necessary, change the fuse.
	PV1 ISO startup fail	Startup isolation too low. ▶ Check isolation resistance on the DC side of the PV modules.
	PV1 ISO running fail	Running isolation < 150 kΩ. ▶ Check isolation resistance on the DC side of the PV modules.
	PV1+ Grounding fail PV1- Grounding fail	PV1+/PV1- not correctly grounded. ▶ Check GND connection. ▶ Check fuse in GND connection. ▶ If necessary, change the fuse.

11.2.2 Other LED and display messages

LED status	Display message	Description of message Troubleshooting
	PV1 voltage too low.	P1 voltage too low. Insolation insufficient. ► Check PV cell voltage in display (menu 416 Actual data PV).
	L1 Power reduction	Power reduction active for L1, L2 or L3.
	L2 Power reduction	
	L3 Power reduction	
	PV1 PW limit to Pn	Power limitation active for PV1.
	PV1 Temp derating	Temperature derating for PV1 active. Reduced power production. The internal temperature of the solar inverter is between +55 °C and +70 °C. ► Check ventilation of solar inverter. ► Prevent direct solar irradiation to the solar inverter.

11.3 View grid setup

Description

The current grid settings can be viewed. The menu is readonly.

Enclosing menu:

Access to menu:

Sample screen:

131 View grid setup

Main menu > Install settings > View grid setup

131	View	grid	setup	
→Grid:		UK	59G	
Fnom:		__.	__Hz	

11.4 Maintenance



DANGER



Risk of death through dangerous voltage

During operation, dangerous voltage is present in the solar inverter. Dangerous voltage is still present for 5 minutes after disconnecting all sources of power.

- Never open the solar inverter. The device contains no user-serviceable parts. Opening the cover will void warranty.

Make the sure the device remains uncovered while in operation.

Clean the solar inverter periodically to avoid the casing of the solar inverter becoming soiled.

12. Repair

DANGER



Risk of death through dangerous voltage

During operation, dangerous voltage is present in the solar inverter. Dangerous voltage is still present for 5 minutes after disconnecting all sources of power.

- ▶ Never open the solar inverter. The device contains no user-serviceable parts. Opening the cover will void warranty

NOTICE

No user serviceable components in the inverter compartment.

12.1 Replacing fan

If the fan does not work properly, it can be exchanged by the user.

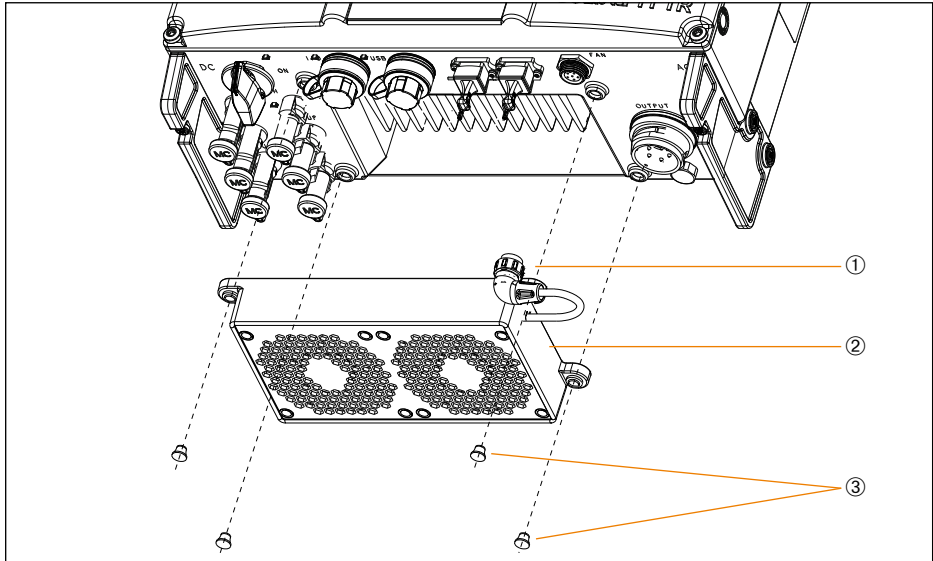


Image 12.1.: Replacing fan

1. Pull out the fan plug ①.
2. Pull out the four fan holders ③.
3. Remove the fan ②.
4. Place the new fan ②.
5. Push in the four fan holders ③.
6. Insert the fan plug ①.

13. Technical data

Input (DC)	
Maximum recommended PV power	13300 W _p
Nominal power	11600 W
Maximum input voltage	1000 V
Feed-in input voltage range ¹⁾	400 ... 900 V
Full power MMP input voltage range	425 ... 800 V
Nominal current	19.5 A @ 600 V
Maximum operating current	29 A
Maximum current per string	29 A

¹⁾ Maximum input voltage without damage: 1000 V

Output (AC)	
Max. apparent power	11000 VA
Nominal apparent power	11000 VA
Voltage range (3-phase, 5-wire) ²⁾	3 x 400 V + N + PE (+18/-20%)
Nominal current	16 A (per phase)
Max. current	20 A
Nominal frequency	50 Hz
Frequency range ²⁾	50 Hz ± 5 Hz
Power factor (cos φ) ³⁾	> 0.99 @ nominal apparent power
Total harmonic distortion (THD)	< 3 % @ nominal apparent power
Night consumption	< 1.3 W
Typical leakage current	<3.5 mA

²⁾ AC voltage and frequency range will be programmed according to the individual country requirements

³⁾ Cos φ = 0.8 cap ... 0.8 ind

Technical data

Standards / directives	
Protection degree ⁴⁾	IP65 / IP54
Safety class	1
Configurable trip parameters	Yes
Insulation monitoring	Yes
Overload behavior	Current limitation; power limitation
Anti-islanding protection / Grid regulation	DIN VDE 0126-1-1; RD 1663; RD 661; ENEL G.L. 2010; UTE 15712-1; Synergrid C10/11; EN 50438; G83/1-1; VDE AR N 4105 (LVD); BDEW (MVD)
EMC	EN61000-6-2; EN61000-6-3; EN61000-3-11; EN61000-3-12
Safety	IEC62103; IEC62109-1 / -2

⁴⁾ IP65 for electronics / IP54 for cooling area

Mechanical design	
Size (L x W x D)	697 x 410 x 182 mm
Weight	39 kg
Cooling	Fan (plug & play)
AC connector	Amphenol C16/3
DC connector	3 pairs of Multi-Contact MC4
Communication interfaces	2 x RJ45 / RS485 + 1 x USB + 1 x I/O interface
DC switch	Integrated
Display	3 LEDs, 4-line LCD

General specification	
Model name	SOLIVIA 11 EU G4 TR
Part number Delta	EOE48030329
Max. efficiency	96.5 %
Efficiency EU	96.0 %
Operating temperature	-25 ... +70 °C
Full power without derating	-25 ... +55 °C
Storage temperature	-25 ... +80 °C
Humidity	0 ... 95 %
Maximum operating altitude	2000 m above sea level

14. Appendix

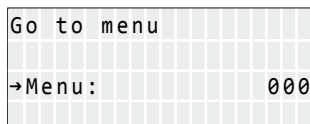
NOTE



To go directly to a specific menu in the display, you can use the Go-to function of the solar inverter.

1. To open the **Go to** menu, press the **Esc** button on the solar inverter for at least 3 seconds.

→ The **Go to** menu is opened.



2. To enter a menu number, press the **ENTER** button.

→ The first digit is flashing.

3. Use the **Up/Down** buttons to enter the first digit of the menu number. Press the **ENTER** button when finished.

→ The second digit is flashing.

4. Enter the second and the third digit.

5. Press the **ENTER** button.

→ The menu with the entered menu number is displayed.

14.1 Overview functions and features

This overview shows all functions and features available for the solar inverter SOLIVIA 11 EU G4 TR.

Function/feature	Short description	Related menu / Manual chapter
Settings for MVD/LVD grids	Functions to set production parameters	500 User Settings "9.3 User settings", p. 71
Active power control	To set active power control for LVD and MVD grids	510 Active PwCtrl "9.3.2 Active power control", p. 72
• Power reduction	To reduce the maximum power	511 Power reduction "9.3.2.2 Power reduction", p. 72
• Power vs frequency	To set the power gradient in dependency of the frequency	512 Power vs. freq "9.3.2.3 Power vs. frequency", p. 73
Reactive power control	To set active power control for LVD and MVD grids	520 Reactive PwCtrl "9.3.3 Reactive power control", p. 75
• Constant $\cos \varphi$	To set a fixed $\cos \varphi$ (inductive or capacitive)	520 Reactive PwCtrl "9.3.3.2 Constant $\cos \varphi$ ", p. 75
• $\cos \varphi$ (P)	To set a $\cos \varphi$ (inductive or capacitive) in dependency of the active power ratio P/P_n	520 Reactive PwCtrl "9.3.3.3 $\cos \varphi$ (P)", p. 76
• Constant reactive power	To set the reactive power ratio Q/S_n . For MVD grids only.	520 Reactive PwCtrl "9.3.3.4 Constant reactive power", p. 77
• Q (U)	To set the reactive power ratio Q/S_n as a function of the voltage U. For MVD grids only.	520 Reactive PwCtrl "9.3.3.5 Q (U)", p. 78
Fault ride through (FRT)	To set parameters for the Q-U-hysteresis. For MVD grids only.	520 Reactive PwCtrl "9.3.4 Fault ride through (FRT)", p. 79
Options		530 FRT settings "9.3.4 Fault ride through (FRT)", p. 79
Isolation and grounding monitoring	To select a mode for isolation and grounding monitoring.	230 Grounding "9.1.2 Date and time", p. 67

Function/feature	Short description	Related menu / Manual chapter
Reports		
Save reports to USB stick	To save all available reports to USB stick	300 USB features "10.7 Create reports", p. 86
View reports on display		
Italian auto test report		600 Diagnostic&Alarm "11.1.1 IT Autotest (for Italy only)", p. 88
Display settings		
Language	To set the language of the display	100 Install settings "9.1.1 Language", p. 66
Date and time	To set date and time	110 Date & time "9.1.2 Date and time", p. 67
Date and time format	To set the format of date and time	111 Format "9.1.3 Date and time format", p. 67
Backlight and contrast	To set backlight and contrast	120 Display settings "9.1.4 Backlight, contrast", p. 67
Standard menu	To choose the display that is shown when the buttons have not been used for a given time.	800 Standard menu "9.5 Standard menu", p. 81
Monitoring		
RS485 (EIA 485) settings	To set RS485 ID and baudrate and to switch terminating resistor on/off.	150 RS485 "9.1.6 RS485 (EIA485)", p. 69
Isolation and grounding monitoring	-	230 Grounding "9.4.1 Isolation and grounding monitoring", p. 80
View statistics		
View statistics on display	-	400 Production info "8. Production information", p. 62
Saving and loading data		
Save statistics to USB stick	-	300 USB features "10.7 Create reports", p. 86
Save settings to USB stick		300 USB features "10.4 Save settings", p. 84

Appendix

Function/feature	Short description	Related menu / Manual chapter
Load settings from USB stick		300 USB features “10.5 Load settings”, p. 84
Save swap data to USB stick	To save data needed when swapping a solar inverter	300 USB features “10.6 Save swap data”, p. 85
Revenue settings		
Currency, Pay per kWh	To set the currency and the pay per kWh	470 Feed-in settings “9.1.1 Language”, p. 66

14.2 Order numbers

Grounding kit	Part number Delta
Groundig Set A Solar	EOE990000275

Earth continuity must be implemented close to the solar inverter. We suggest using Delta's grounding kit “Grounding Set A Solar”.

Cable coupler types for DC cable connection to the inverter. The DC+ connector of the solar inverter is male, the DC– connector is female.

DC connector	Cable coupler type	Wire size		Range of cable sheath diameter mm	Multi-Contact order number
		mm ²	AWG		
DC+	Female	1.5/2.5	14	3 - 6	32.0010P0001-UR
				5.5 - 9	32.0012P0001-UR
		4/6	10	3 - 6	32.0014P0001-UR
				5.5 - 9	32.0016P0001-UR
DC–	Male	1.5/2.5	14	3 - 6	32.0011P0001-UR
				5.5 - 9	32.0013P0001-UR
		4/6	10	3 - 6	32.0015P0001-UR
				5.5 - 9	32.0017P0001-UR

UTE kit Multi-Contact	Part number Delta
UTE kit Multi-Contact for European SOLIVIA solar inverters	EOE90000341

The UTE Multi-Contact kit is dedicated for the latest French standard UTE C 15-712-1. This contains 8 DC locking devices, an assembly tool and an additional signalling sticker. This kit will allow you to fulfil DC protection and signalling requirements specified in the UTE C 15-712-1 regulation.

Cables for RS485 connection	Delta part number
Cable to connect inverter with inverter	
Harting push pull cable; IP67; one side with blue cable manager, other side with white cable manager	
1.5 m	3081186300
3.0 m	3081186500
5.0 m	3081186600
10.0 m	3081186200
20.0 m	3081186400
Connect cable from last solar inverter to a monitoring gateway device such as Solivia Basic Gateway, Solarlog or Meteocontrol WEB'logger	
Outdoor cable; IP65; with Harting RJ45 push pull and RJ12 plugs	Contact Delta support

If you want to assemble the cables yourself to connect inverter with inverter, you have to use cable managers from Harting (IP67 push pull system cable RJ45).

It is recommended to use a blue cable manager on one side and a white cable manager on the other side.

Cable managers	Harting part number
RJI IP67 Data plug push pull 8-pol white	09 45 145 1500
RJI IP67 Data plug push pull 8-pol blue	09 45 145 1510

HARTING Deutschland GmbH & Co. KG (P.O. 2451, D-32381 Minden; www.harting.com)

14.3 Overview menu structure

100 Install settings	
Language:	English
Date & time	
Display settings	
Grid selection	
Mppt:	PV1
RS485	

110 Date & time	
Date:	2012/01/07
Time:	03:05:19pm
Format	

111 Format	
Date:	YYYY/MM/DD
Time:	12h

120 Display settings	
Backlight:	auto
Contrast:	10

130 Grid selection	
View grid setup	
Change grid	
Customized country	

132 Change grid	
Grid:	UK G59
Key:	#####
PIN: 0000	Confirm

150 RS485	
ID:	#
Baudrate:	19200
Termination:	Off

200 Options	
Grounding	

230 Grounding	
PV1:	ISO/GND Off

300 USB features	
State:	disabled
Firmware update	
Save settings	
Save swap data	
Create reports	
Load settings	
Service	

400 Production info	
Actual data	
Day statistics	
Week statistics	
Month statistics	
Year statistics	
Total statistics	
Feed-in settings	
Event journal	

410 Actual data	
Actual overview	
Actual data AC	
Actual data L1	
Actual data L2	
Actual data L3	
Actual data PV1	
Actual date&time	
Actual isolation	

411 Actual overview	
Now:	200W
Day:	2000Wh
Normal operation	

412 Actual data AC	
L1 Voltage:	---V
L2 Voltage:	---V
L3 Voltage:	--V
L1 Freq.:	--.--Hz
L2 Freq.:	--.--Hz
L3 Freq.:	--.--Hz
L1 Current:	---A
L2 Current:	---A
L3 Current:	---A
L1 P:	---W
L2 P:	---W
L3 P:	---W
L1 Q:	---Var
L2 Q:	---Var
L3 Q:	---Var
L1 DC inj:	---mA
L2 DC inj:	---mA
L3 DC inj:	---mA

414 Actual data L2	
Voltage:	---V
Freq:	--.--Hz
Current:	---A
P:	---W
Q:	---Var
DC inj:	---mA

415 Actual data L3	
Voltage:	---V
Freq:	--.--Hz
Current:	---A
P:	---W
Q:	---Var
DC inj:	---mA

417 Actual data PV1	
Voltage:	---V
Current:	-.A

41A Actual date&time
Date: 2012/01/07
Time: 03:05:19pm

41B Day stat. ISO
R ISOmax: ---kΩ
R ISOmin: ---kΩ

420 Day statistics
Day stat. AC
Day stat. PV
Day stat. ISO
430 Week statistics
440 Month statistics
450 Year statistics
460 Total statistics

421 Day stat. AC
Energy: ---Wh
Runtime: :---h
Revenue: :---h
L1 Δf: --.--/--.--Hz
L2 Δf: --.--/--.--Hz
L3 Δf: --.--/--.--Hz
L1 Imax: -.--A
L2 Imax: -.--A
L3 Imax: -.--A
L1 ΔU: ---/---V
L2 ΔU: ---/---V
L3 ΔU: ---/---V
L1 Pmax: ---W
L2 Pmax: ---W
L3 Pmax: ---W
L1 Qmax: ---Var
L2 Qmax: ---Var
L3 Qmax: ---Var
L1 Qmin: ---Var
L2 Qmin: ---Var
L3 Qmin: ---Var
431 Week stat. AC
441 Month stat. AC
451 Year stat. AC
461 Total stat. AC

422 Day stat. PV
PV1 Imax: ---A
PV1 Umax: ---V
PV1 Pmax: ---W
432 Week stat. PV
442 Month stat. PV
452 Year stat. PV
462 Total stat. PV

423 Day stat. ISO
R ISOmax: ---kΩ
R ISOmin: ---kΩ
433 Week stat. ISO
443 Month stat. ISO
453 Year stat. ISO
463 Total stat. ISO

470 Feed-in settings
Currency: GBP
EUR / kWh: 2.34
Revenue

500 User settings
Active PwCtrl
Reactive PwCtrl

510 Active PwCtrl
Power reduction
Power vs freq

511 Power reduction
Max P: --%

512 Power vs freq
Start freq: --.--Hz
Stop freq: --.--Hz
Gradient: --%

520 Reactive PwCtrl
Mode: disabled

520 Reactive PwCtrl
Mode: Fix cos phi
Cos phi: ind 1.00

520 Reactive PwCtrl
Mode: Cos phi(P)
A Cos phi: ind 1.00
B Power ratio: ---%
B Cos phi: ind 1.00
C Power ratio: ---%
C Cos phi: ind 1.00
D Cos phi: ind 1.00

500 User settings
Active PwCtrl
Reactive PwCtrl
FRT settings

510 Active PwCtrl
Power reduction
Power vs freq

511 Power reduction
Max P: --%

512 Power vs freq
Start freq: --.--Hz
Stop freq: --.--Hz
Gradient: --%
Recover fr: --.--Hz

520 Reactive PwCtrl
Mode: disabled

520 Reactive PwCtrl
Mode: Fix cos phi
Cos phi: ind 1.00

520 Reactive PwCtrl
Mode: Fix Q
Q/Sn: ind ---%

Appendix

520 Reactive PwCtrl	
Mode:	Q (U)
Low Q/Sn:	cap ---%
High Q/Sn:	cap ---%
Low Ulim:	---V
High Ulim:	---V
Hysteresis:	---V
Delay time:	-.--s

520 Reactive PwCtrl	
Mode:	Cos phi (P)
A Cos phi:	ind 1.00
B Power ratio:	---%
B Cos phi:	ind 1.00
C Power ratio:	---%
C Cos phi:	ind 1.00
D Cos phi:	ind 1.00

530 FRT settings	
K factor:	2
DeadBand Vh:	---V
DeadBand Vl:	---V
Max sym cur:	---%
Max asym cur:	---%
Mode:	On

600 Diagnostic&Alarm
Internal log

600 Diagnostic&Alarm
Internal log
Report LVD

600 Diagnostic&Alarm
Internal log
Report MVD

600 Diagnostic&Alarm
Internal log
IT Autotest

700 Inverter info
Software vers.
Inverter data

710 Software vers.
AC:
AC1:
AC2:
AC3:
DC:
DC1:
DC2:
DC3:
SYS:
PWR:
WD:
ENS:
IT:

720 Inverter data
Production data:
--/--
Serial number:
#####



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affiliations mark ISO 15020:2005, ISO 9001:2008 und ISO 14001:2004

Prüfbescheinigung Certificate

Antragsteller:
Applicant:

Produkt Typ:
Product type:

Modell:
Model:

Schutzart:
IP-Code:

Delta Energy Systems (Germany) GmbH
Technische Str. 21
79331 Tettingen, Germany

Wechselrichter
Solar inverter

SOLVIA11EU4TR-E0648030114

IP65

Ein repräsentatives Testmuster des o.g. Modells bestand die Prüfung nach
A representative test sample of above stated model passed the tests according to

Norm: Standard
IEC 60528:1989 + A1:1999 / EN 60528:1991 + A1:2000


Bericht Nr.: Report No.
11TH026-IEC60528_9

Zertifikat Nr.: Certificate No.
11-168

Datum: Issued
26.08.2011



Test certificate



EC Declaration of Conformity

Hersteller:
Manufacturer:

Produkt:
Product:

Modell:
Model:

Delta Energy Systems (Germany) GmbH
Technische Str. 21, D - 79331 Tettingen, Germany

Solar Inverter for Grid operation

SOLVIA11EU4TR in E0648030114

Das Produkt beschrieben oben ist in der Form wie geliefert in der Übereinstimmung mit den Bestimmungen der folgenden Europäischen Richtlinien:
The product described above is in the form as delivered in conformity with the provisions of the following European Directives:

2004/108/EG Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility

2006/95/EC Council Directive on the approximation of the laws of the Member States related to electrical equipment designed for use within certain voltage limits

Normen:
Standards:

EN 61000-6-2: 2005
EN 61000-6-3: 2007
EN 61000-3-2: 2006
EN 61000-3-3: 1995 + A1: 2001 + A2: 2005 in
EN 61000-3-11: 2000
EN 61000-3-12: 2005 + EN 61000-3-11: 2000 in

Sicherheit:
Safety:

EN 60950-1: 2006
IEC 62108-1: 2010-04
EN 60950-2: 2006
IEC 62108-2: 2006
EN 61178: 1997

Das Produkt beschrieben oben sollte auch mit der VDEW-Publikation:
The product described above also comply with the VDEW Publication:

- Richtlinie für Anschluss und Parallelbetrieb von Eigenzeugungsanlagen an Niederspannungsnetze, VDE 0171:2008 (Grid Connection and Parallel Operation of Self-Generating Installations to Low Voltage Networks, VDE 0171:2008)
- MVD (Mid Voltage Directive) Mittelspannungsrichtlinie (TGA Rev2, TGD Rev22, TGB Rev2)

Unterschrift:
Signature:

Dr. Mathias Ersmann
General Manager

Name, Funktion:
Name, Function

Tettingen, 30. Jan. 2012

Dr. Mathias Ersmann
General Manager

Dr. Mathias Ersmann
General Manager

Signature

Dr. Mathias Ersmann
General Manager

Signature

Dr. Mathias Ersmann
General Manager

Signature



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Verklaring van geen bezwaar

Aanvrager: Delta Energy Systems GmbH
Tscheulinstrasse 21
79331 Teningen
Duitsland

Product: Automatisch schakelstation tussen een netparallelle zelfopwekinstallatie en het openbare laagspanningsnet

Model: SOLIVIA 11EUG4TR EOE48030114

Reglementair voorgeschreven gebruik:
Aan de afnemer te leveren, overeenkomstig C10/11 – 05:2009, Bijlage 3 voor fotovoltaïsche installaties met een driefase parallelvoeding door middel van gelijkstroom-wisselstroomcombinator in het net van de openbare voorziening. Het automatische schakelstation vormt een integraal bestanddeel van de hoger vermeldde gelijkstroom-wisselstroomcombinators.

Controlebasis:
C10/11 – 05:2009
DIN V VDE V 0126-1-1:2006-02

Een representatief testpatroon van het hoger vermeldde product voldoet aan de op het moment van de uitreiking van dit attest geldende veiligheids technische eisen van de vermeldde controlegrondbeginselen voor een reglementair voorgeschreven gebruik.

Rapportnummer: 11TH0120-C10-11
Certificaatnummer: U12-0090
Datum: 2012-01-19
Geldig tot: 2015-01-18

Achim Hanchen



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Certificat de conformité

Demandeur: Delta Energy Systems GmbH
Tscheulinstrasse 21
79331 Teningen
Allemagne

Produit: Dispositif de déconnexion automatique entre un générateur et le réseau public à basse tension

Modèle: SOLIVIA 11EUG4TR EOE48030114

À utiliser conformément aux réglementations:
Dispositif de coupure automatique avec une surveillance du réseau triphasé, conformément à C10/11 – 05:2009, annexe 3. Le dispositif est destiné à être installé dans une installation de production d'énergie photovoltaïque, dans l'alimentation électrique publique. Le dispositif de coupure automatique fait partie intégrante de ce convertisseur. Il remplace le appareil de déconnexion avec une fonction solente, auquel le fournisseur du réseau de distribution peut accéder à tout moment.

Réglementations et normes appliquées:
C10/11 – 05:2009
DIN V VDE V 0126-1-1:2006-02

Un échantillon représentatif des produits mentionnés ci-dessus correspond à la date de la délivrance de ce certificat en vigueur des exigences de sécurité technique et pour l'utilisation conformément à sa destination.

Numéro de rapport: 11TH0120-C10-11
Numéro de certificat: U12-0090
Délivré le: 2012-01-19
Valide jusque le: 2015-01-18

Achim Hanchen



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Solicitante:
Delta Energy Systems GmbH
Tschellinstraße 21
79331 Tübingen
Alemania

Producto:
Inversor fotovoltaico

Modelo:
SOLIVIA 11EUG4TR EOE49030114

Certificado de conformidad

Confirmamos que los inversores de conexión a la red citados en este documento cumplen con la normativa española sobre conexión de instalaciones fotovoltaicas a la red de baja tensión. Los inversores disponen de separación galvánica entre la red de distribución y la instalación fotovoltaica. La corriente continua inyectada en la red de distribución por el inversor es inferior al 0,5% del valor eficaz de la corriente nominal de salida, medida tal como indica la "Nota de interpretación de las funciones de protección para las frecuencias de interconexión máxima y mínima conforme al Real Decreto 661/2007 (51 y 48 Hz, respectivamente) y mínima (1,1 y 0,85 U_n, respectivamente) están correctamente implementadas en el software de los inversores, de modo que los usuarios puedan modificar los valores de ajuste de las protecciones mediante software. Los equipos disponen de protección frente al funcionamiento en isla. El tiempo de reconexión de los inversores es de al menos 3 minutos conforme a la norma IEC 61727/2001, una vez que los parámetros de la red vuelven a estar dentro de los márgenes permitidos.

Bases de certificación:
RD 1663/2000, RD 661/2007, DIN V VDE V 0126-1-1:2006-02 y nota de interpretación técnica de la equivalencia de la separación galvánica de la conexión de instalaciones generadoras en baja tensión. El concepto de seguridad de un producto representativo de los mencionados arriba, corresponde, en el momento de la emisión de este certificado, a las especificaciones válidas de seguridad para el empleo especificado conforme a la normativa vigente.

Número de informe: 11TH0120-RD1663
Número de certificado: U12-0081
Fecha: 2012-01-18 **Válido hasta:** 2015-01-17



Achim Hanchen

Spain - Declaration of conformity



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Žadatel:
Delta Energy Systems GmbH
Tschellinstraße 21
79331 Tübingen
Německo

Výrobek:
Samostatná spínací stanice mezi síťové paralelním vlastním výrobním zařízením a veřejnou sítí nízkého napětí.

Model:
SOLIVIA 11EUG4TR EOE49030114

Používání podle určení:
Samostatná spínací stanice s třífázovou kontrolou sítě dle DIN V VDE V 0126-1-1:2006-02 (s ČR ochrannými posuvnými EN 60947-3-1) pro oddělování zařízení s třífázovým paralelním zapojením od EN 60947-3-1 sítě, včetně ochrany před proudem zpět (Savannah) a sítě, soudržnosti výše uvedených měřičů s oddělovacím transformátorem. Tato slouží jako náhrada za spínací stanici s dělicí funkcí, která je kdykoliv přístupná provozovateli rozvodné sítě (VNE).
49.5747-49.5942

Zkušební podklady:
EN 50438/2007, DIN V VDE V 0126-1-1:2006-02, EN 50126-1-1:2006-02, a Vlastní výrobní zařízení u sítě sítě nízkého napětí s doplnky VDN, stav 2005, od elektrárenského svazu (VDEW) a od svazu provozovatelů sítě (VDN).
Reprezentativní zkušební vzorek výše jmenovaného výrobku odpovídá bezpečnostně technickým požadavkům platným v okamžiku vydání tohoto certifikátu, uvedených zkušebními podklady pro používání podle určení.

Číslo zprávy: 11TH0120-EN50438_CZE
Číslo certifikátu: U12-0088
Datum: 2012-01-19 **Platnost do:** 2015-01-18



Achim Hanchen

Czech Republic - Declaration of conformity



Certificate of compliance

Applicant: Delta Energy Systems GmbH
Tscheulinstrasse 21
79331 Teningen
Germany

Product: Automatic disconnection device between a generator and the public low-voltage grid

Model: SOLIVIA 11EUG4TR EOE48030114

Use in accordance with regulations:

Automatic disconnection device with three-phase mains surveillance in accordance with Engineering Recommendation G59/2 for photovoltaic systems with a three-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter. It serves as a replacement for the disconnection device with isolating function that can access the distribution network provider at any time.

Applied rules and standards:

DNV V VDE V 0125-1-1:2006-02 (Reliability) and Engineering Recommendation G59/2. The SOLIVIA 11EUG4TR EOE48030114 is rated >16A per phase <= 50kW (3 phase). The default values for "Small Power Stations" on the low-voltage grid were verified.

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: 11TH0120-G59/2

Certificate number: U12-0101

Date of issue: 2012-01-24

Valid until: 2015-01-23

Achim Hanchen



Certificat de conformité

Demandeur: Delta Energy Systems GmbH
Tscheulinstrasse 21
79331 Teningen
Allemagne

Produit: Dispositif de déconnexion automatique entre un générateur et le réseau public à basse tension

Modèle: SOLIVIA 11EUG4TR EOE48030114

A utiliser conformément aux réglementations:

Dispositif de coupure automatique avec une surveillance du réseau triphasé, conformément à DNV V VDE V 0125-1-1:2006-02, pour des systèmes photovoltaïques avec un couplage parallèle triphasé, via un onduleur. Le dispositif de déconnexion est une partie intégrante de l'onduleur. Il remplace l'appareil de déconnexion avec une fonction isolante, auquel le fournisseur du réseau de distribution peut accéder à tout moment.

Synthèse des dispositions de prévention

Séparation galvanique	Polarité d.c. à la terre	Dispositions pour la prévention	Dispositif est capable
Oui	Non	Cas 1 - Champ PV sans polarité réelle intentionnellement à la terre et avec séparation galvanique	Oui
Oui	Directe	Cas 2 - Champ PV avec polarité réelle intentionnellement à la terre par résistance et avec séparation galvanique	Non
Oui	Par Résistance	Cas 3 - Champ PV avec polarité réelle intentionnellement à la terre par résistance et avec séparation galvanique	Non
Non	Non	Cas 4 - Champ PV sans polarité réelle intentionnellement à la terre et sans séparation galvanique	Non

Réglementations et normes appliquées:

UTE C 15-712:2010-07, DNV VDE V 0125-1-1:2006-02 et «Générateur au réseau électrique basse tension public, quatrième édition 2001, le guide de connexion et d'utilisation parallèle des générateurs dans le réseau électrique basse tension» avec les additions de VDN (2005), provenant de l'association allemande des producteurs d'énergie photovoltaïque (BSPV) et de l'association allemande des producteurs d'énergie éolienne (BWE).

Un échantillon représentatif des produits mentionnés ci-dessus correspond à la date de la délivrance de ce certificat en vigueur des exigences de sécurité technique et pour l'utilisation conformément à sa destination.

Numéro de rapport: 11TH0120-UTE C15-712-1

Numéro de certificat: U12-0091

Validé jusqu'à le: 2015-01-18

Délivré le: 2012-01-19

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Certificado de conformidade

Requerente:

Delta Energy Systems GmbH
Tschelistrasse 21
79331 Teningen
Alemanha

Produto:

Microgerador em paralelo com redes de distribuição pública de baixa tensão

Modelo:

SOLVIA 11EUG4TR EOE48030114

Utilização de acordo com os regulamentos:

Dispositivo de desconexão automática com monitorização da rede trifásica para sistemas fotovoltaicos com um circuito paralelo trifásico através de um inversor na alimentação pela rede pública. O dispositivo de desconexão automática é parte integrante do inversor anteriormente mencionado.

Regras e normas aplicadas:

EN 50438:2007 com as definições de protecção de interface padrão para Portugal. O SOLVIA 11EUG4TR EOE48030114 é dimensionado para >16 A por fase, mas todos os requisitos básicos da norma são cumpridos.

sobretensão 264,5 V
sobretensão 264,5 V
sobrefrequência 51,0 Hz
subfrequência 47,0 Hz

Aquando da emissão deste certificado, o conselho de protecção de interface de um produto representativo anteriormente mencionado corresponde a especificações de segurança válidas para a utilização especificada, de acordo com os regulamentos. Os testes e certificação foram realizados de acordo com a norma ISO/IEC 17025 – OIA 07.0204

Número de relatório: 11TH0120-EN50438

Número de certificado: U12-0087

Data de emissão: 2015-01-19

Válido até:

2015-01-18

Achim Hanchen

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Germany
Businesspark A&B
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Verklaring van geen bezwaar

Aanvrager:

Delta Energy Systems GmbH
Tscheldlinstrasse 21
79331 Teningen
Duitsland

Product:

Automatisch schakelstation tussen een netparallelle
zelfopwekinstallatie en het openbare laagspanningsnet

Model:

SOLVIA 11EU4TR EOE48930114

Reglementair voorgeschreven gebruik:

Automatisch schakelstation met deelslage netverbewaking conform DIN V VDE V 0126-1-1:2006-02
(afwijkende grenswaarden voor Nederland op basis van EN 50438:2007, Annex A")
voor fotovoltaïsche installaties met een deelslage parallelvoeding door middel van gelijkstroom-
omvormers met een ingebouwd laagspanningsnet. Het schakelstation wordt gebruikt met een
een integraal bestanddeel van hoger vermeld gelijkstroom-wisselstroomomvormer met
schakeltransistor. Deze dient als vervangingsmiddel voor een te allen tijde voor de
distributienetexploitant ("VNB") toegankelijk schakelstation met scheidingsfunctie.

Inschakelspanning:
frequentie 48-62Hz/50Hz
schakeling 3p/2-0

Controlebasis:

EN 50438:2007, DIN V VDE V 0126-1-1:2006-02 en, Zelfopwekinstallaties aan het
laagspanningsnet, 4^{de} uitgave 2001, richtlijn voor aansluiting en parallelle verwerking van
zelfopwekinstallaties aan het laagspanningsnet met VDN supplementen, stand 2005 van de „Verband
der Elektrischen Wirtschaft“ (VDE) en van de „Verband der Netzbetreiber“ (VDN).

Een representatieve testpatroon van het hoger vermelde product voldoet aan de op het moment van de
uitreiking van dit attest gedeelde veiligheidsrisico's eisen van de vermelde controleorgaanbegranselen
voor een reglementair voorgeschreven gebruik.

Rapportnummer: 11TH0120/EN50438_NED

Certificaatnummer: U12-0102

Datum:

2012-01-24

Geldig tot:

2015-01-23

Achim Händchen



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Сертификат за съответствие

Заявитель:
Delta Energy Systems GmbH
Tschellstrasse 21
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Германия

Продукт:
Автоматичен изключвател между генератор и обществената електрозапределителна мрежа за ниско напрежение

Модел:
SOLIVIA 11EUG4TR EOE48030114

Експлоатация в съответствие с нормативните актове:
Автоматичен изключвател с наблюдение на трифазна мрежа в съответствие с DIN V VDE V 0128-1-1:2006-02 за фотоволтаични системи с трифазно паралелно свързване посредством инвертор в обществената електрозапределителна мрежа. Автоматичният изключвател е неразделна част от инвертора и е предназначен за използване в съответствие с функциите на инвертора, докато операторът на електрозапределителната мрежа може да има достъп по всяко време.

Приложими правила и стандарти:
DIN V VDE V 0128-1-1 (VDE V 0128-1-1:2006-02) и Генератор в обществената електрозапределителна мрежа за ниско напрежение, 2006-02-01, за паралелна експлоатация на генераторите в обществената електрозапределителна мрежа за ниско напрежение с VDN допълнения (2005) на Германската асоциация на производителите на електроенергия (German Electricity Association (VEW)) и Асоциацията на мрежовите оператори (Association of network operators (VON)).

Концепцията за безопасност на горюполените представителен продукт отговаря, към момента на издаване на сертификата, на изискванията за безопасност за пълното прилагане в съответствие с нормативните актове.

Номер на протокола:
11TH0120-VDE0126

Номер на сертификата:
U12-0104

Дата на издаване:
2012-01-24

Валиден до:
2015-01-23


Achim Hanchen

Bulgaria - Сертификат за съответствие



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Unbedenklichkeitsbescheinigung

Antragsteller:
Delta Energy Systems GmbH
Tschellstrasse 21
79331 Tengen
Deutschland

Erzeugnis:
Selbsttätige Schaltstelle zwischen einer netzparallelen Eigenenergieungsanlage und dem öffentlichen Niederspannungsnetz

Modell:
SOLIVIA 11EUG4TR EOE48030114

Bestimmungsgemäße Verwendung:
Selbsttätige Schaltstelle mit dreiphasiger Netzüberwachung gemäß DIN V VDE V 0128-1-1:2006-02 für Photovoltaikanlagen mit einer Leistung bis zu 100 kW, die parallel zur öffentlichen Niederspannungsanlage (VDN) betrieben werden. Die Schaltstelle ist ein Bestandteil des Inverters und ist als Ersatz für eine jederzeit dem Verteilungsnetzbetreiber (VNB) zugängliche Schaltstelle mit Trennfunktion.

Prüfgrundlagen:
DIN V VDE V 0128-1-1 (VDE V 0128-1-1:2006-02) und „Eigenenergieungsanlagen am Niederspannungsnetz, 4. Ausgabe 2001, Richtlinie für Anschluss und Parallelbetrieb von Eigenenergieungsanlagen am Niederspannungsnetz“ mit VDN Ergänzungen, Stand 2005 vom Verband der Elektrizitätswirtschaft (VDEW) und vom Verband der Netzbetreiber (VDN).

Ein repräsentatives Testmuster des oben genannten Erzeugnisses entspricht den zum Zeitpunkt der Ausstellung dieser Bescheinigung geltenden sicherheitstechnischen Anforderungen der aufgeführten Prüfgrundlagen für die bestimmungsgemäße Verwendung.

Bericht Nummer:
11TH0120-VDE0126

Zertifikat Nummer:
U11-1243

Datum:
2011-12-19

Gültig bis:
2014-12-18


Achim Hanchen

Germany - Unbedenklichkeitsbescheinigung



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Certificat de conformité

Demandeur: Delta Energy Systems GmbH
Tschellinstraße 21
79331 Tettnen
Allemagne

Produit: Dispositif de déconnexion automatique entre un générateur et le réseau public à basse tension

Modèle: SOLIVIA 11EUG4TR EOE48030114

À utiliser conformément aux réglementations:
Dispositif de coupure automatique avec une surveillance du réseau triphasé, conformément à DIN V VDE V 0126-1-1:2006-02 et à la norme allemande pour les convertisseurs de alimentation électrique publique. Le dispositif de coupure automatique fait partie intégrante de ce convertisseur. Il remplace l'appareil de déconnexion avec une fonction isolante, auquel le fournisseur du réseau de distribution peut accéder à tout moment.

Réglementations et normes appliquées:
DIN V VDE V 0126-1-1:2006-02 et «Générateur au réseau électrique basse tension public, quatrième édition 2001, le guide de connexion et d'utilisation parallèle des générateurs dans le réseau électrique basse tension» avec les additions de VDE (2005), provenant de l'association allemande du service public de l'énergie «VDEW» et l'Association d'opérateur d'un réseau «VDN».

Un échantillon représentatif des produits mentionnés ci-dessus correspond aux exigences de sécurité technique en vigueur à la date d'émission de ce certificat pour l'usage spécifique et conformément à la réglementation.

Numéro de rapport: 11TH0120-VDE0126
Numéro de certificat: U12-0106
Delivré le: 2012-01-24

Valide jusqu'au : 2015-01-23



Achim Handchen
Certification



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Certificate of compliance

Applicant: Delta Energy Systems GmbH
Tschellinstraße 21
79331 Tettnen
Germany

Product: Automatic disconnection device between a generator and the public low-voltage grid

Model: SOLIVIA 11EUG4TR EOE48030114

Use in accordance with regulations:
Automatic disconnection device with three-phase mains surveillance in accordance with DIN V VDE V 0126-1-1:2006-02 and «Generator at the public low-voltage grid, 4th edition 2001, guidelines for connection and parallel operation of generators in the public low-voltage grid» with VDN additions (2005) from the German Electricity Association (VDEW) and Association of network operator (VDN).

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: 11TH0120-VDE0126
Certificate number: U12-0105
Date of issue: 2012-01-24

Valid until: 2015-01-23



Achim Handchen



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Certificat de conformitate

Solicitant:
Delta Energy Systems GmbH
Tschaulinstrasse 21
79331 Teningen
Germany

Prodot:
Dispozitiv de deconectare automată între generator și rețelele de distribuție publică de joasă tensiune

Model:
SOLIVIA 11EUG4TR EOE4803014

A se utiliza în conformitate cu regulamentele de mai jos:
Dispozitiv de deconectare automată a sistemului de supraveghere a curentului trifazic în conformitate cu DIN V VDE V 0126-1-1:2006-02 pentru sistemele fotovoltaice cu o brangare trifazică paralelă prin intermediul unui dispozitiv de deconectare automată în cazul în care este necesară deconectarea deconectare automată este parte integrată a inventului menționat anterior. Acesta servise drept înlocuitor al dispozitivului de deconectare cu funcția de izolare, pe care furnizorul rețelei de distribuție îl poate ordina de asemenea.

Reguli și standarde aplicabile:
DIN V VDE V 0126-1-1 VDE V 0126-1-1:2006-02 și Generator în rețeaua de distribuție publică de joasă tensiune, ediția a patra, 2001, norme privind racordarea și funcționarea în paralel a generatorilor din rețeaua de distribuție publică de joasă tensiune" cu adăugile VDE (VDN) din partea Asociației Germane de Electricitate (VDEW) și a Asociației Operatorilor de Rețea (VDN).
Conținutul de siguranță al produsului reprezentativ susmenționat corespunde, la momentul emiterii prezentului certificat, specificațiilor valide privind siguranța pentru utilizarea specificată în conformitate cu normele.

Număr raport:
11TH0120-VDE0126

Număr certificat:
U12-0107

Data emiterii:
2012-01-24

Valabil până la:
2015-01-23


Achim Hanchen

Romania - Certificat de conformitate



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Certifikát o zhode

Žiadateľ:
Delta Energy Systems GmbH
Tschaulinstrasse 21
79331 Teningen
Nemecko

Produkt:
Zariadenie na automatické odpojenie medzi generátorom a verejnou elektrickou sieťou s nízkym napätím

Model:
SOLIVIA 11EUG4TR EOE4803014

Použitie v súlade s predpismi:
Zariadenie na automatické odpojenie s dôchodom nad trojfázovým napájaním v súlade s normou DIN V VDE V 0126-1-1:2006-02 pre fotopápané systémy s trojfázovým paralelným spojením. Zariadenie na automatické odpojenie je rozdelené na súčasti uvedené v predpisoch.

Použitie predpisov a štandardov:
Norma DIN V VDE V 0126-1-1 VDE V 0126-1-1:2006-02 a predpis „Generator at the public low-voltage grid, 4th edition 2001, guideline for connection and parallel operation of generators in the public low-voltage grid“ (VDEW) 2001, „Pravidla pro připojení a paralelní provoz generátorů ve veřejné elektrické síti s nízkým napětím“ a dodatky asociácie VDN (2005) od nemeckej asociácie pre elektrinu (VDEW) asociácie súčasných operátorov (VDN).
Koncept bezpečnosti uvedeného reprezentatívneho produktu zodpovedá v čase vystavenia tohto certifikátu platným bezpečnostným požiadavkám na určený spôsob použitia v súlade s predpismi.

Číslo správ:
11TH0120-VDE0126

Číslo certifikátu:
U12-0108

Dátum vystavenia:
2012-01-24

Platnosť do:
2015-01-23


Achim Hanchen

Slovakia - Certifikát o zhode

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